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WILBUR RESERVOIR BRIDGE REPLACEMENT DRAFT ENVIRONMENTAL ASSESSMENT

Carter County, Tennessee



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CHAPTER 1 - PURPOSE AND NEED FOR ACTION

The Tennessee Valley Authority (TVA) is proposing to replace the existing roadway bridge across Wilbur Reservoir on the Watauga River in Carter County, near Elizabethton, Tennessee (Figure 1). The existing bridge, Wilbur Reservoir Bridge, carries Wilbur Dam Road over Wilbur Reservoir (Figure 2) and provides the only vehicular access to local residences and important TVA hydropower and recreation facilities. After considering several options to address the condition of the existing bridge, TVA is proposing to construct a new concrete bridge just downstream of the existing bridge (Figure 3). TVA plans to begin construction of the new bridge in 2024. Once the new bridge is constructed, TVA proposes to demolish and remove the existing bridge.



Figure 1. Regional map location for Wilbur Reservoir Bridge



Figure 2. The existing Wilbur Reservoir Bridge, carrying Wilbur Dam Road over Wilbur Reservoir

1.1 Purpose and Need

TVA's purpose and need of the Proposed Action (or Project) is to improve the safety and reliability of the bridge carrying Wilbur Dam Road over Wilbur Reservoir. The existing bridge, Wilbur Reservoir Bridge, was assembled in 1942 from a repurposed railroad bridge dating from the 1890's. It is a fracture critical¹ truss bridge with steel trusses (some of which are nearly 130 years old), concrete decking, and abutments and piers made of reinforced concrete. The bridge is currently "load posted," which means it cannot safely carry normal highway loads and has structural issues that require it to be inspected annually.

The bridge and Wilbur Dam Road serve as the only access point to Watauga Dam, Watauga Hydro Plant, Watauga Dam Campground, the Watauga Dam Boat Ramp, and a small community of residences along Lookout Lane and Raven Rock Cove Road. Because TVA operations and residents in surrounding communities rely on the Wilbur Dam Road

¹ Fracture critical refers to a condition in which the failure of one or more members of a bridge would be expected to result in collapse of the bridge.

and bridge to access these areas, TVA must ensure that a bridge is safe and reliable and can serve TVA and the public in the future.

1.2 Decision to be Made

This environmental assessment is being prepared to inform TVA decision makers and the public about the environmental consequences of the Proposed Action. The decision TVA must make is whether to replace the existing Wilbur Reservoir Bridge.

1.3 Related Environmental Reviews and Consultation Requirements

TVA is the lead federal agency in the preparation of this environmental assessment. The Wilbur Reservoir Bridge is located on public lands managed by TVA as well as the U.S. Forest Service. Management of TVA-managed reservoir lands in the vicinity of the bridge are guided by the Wilbur Reservoir Land Management Plan (RLMP). The Wilbur RLMP was the result of a planning effort addressed by TVA in the *Northeastern Tributary Reservoirs Land Management Plan Final EIS* (TVA 2010). The Wilbur RLMP guides resource management and administration decisions on approximately 58 acres around Wilbur reservoir that are publicly owned and managed by TVA. The RLMP identifies the most suitable uses for parcels of TVA-managed land by providing areas for Project Operations, Sensitive Resource Management, Natural Resource Conservation, Developed Recreation, and Shoreline Access.

The area that would be impacted by TVA's Proposed Action (herein referred to as the Project Area) would comprise approximately 13.9 acres. Wilbur Reservoir Bridge, and thus the Project Area is surrounded by the Cherokee National Forest, which is managed by the U.S. Forest Service (USFS). TVA holds an easement across the Cherokee National Forest lands for the roadway and the bridge. A Congressionally designated wilderness area, Big Laurel Branch Wilderness, is adjacent to the Project Area on the eastern side. The USFS manages these lands based on the *Cherokee National Forest Revised Land and Resource Management Plan* (USFS 2004). TVA consulted with the Cherokee National Forest's Watauga/Unaka Ranger District about the Project. Forest officials concluded that the Project would fall outside of the Wilderness boundary and therefore the Project should have no impacts to National Forest lands. TVA will continue to communicate with the Ranger District on the proposal and, if approved, planned construction activities.

As described in Section 3.1 below, TVA would be required to obtain Clean Water Act (CWA) Section 404 permits from the U.S. Army Corps of Engineers (USACE) for construction of the new footings in the reservoir, bank stabilization associated with the new bridge, removal of the footings for the existing bridge, and temporary impacts associated with the installation of a bulkhead for construction and demolition purposes. TVA would also need to obtain permits from the Tennessee Department of Environment and Conservation (TDEC) to comply with CWA requirements. TVA would obtain CWA Section 401 certification and Aquatic Resource Alteration Permits (ARAP) from TDEC for proposed impacts to the reservoir. In addition, coverage under the TDEC Construction Stormwater General Permit would be required since the area of disturbances (including laydown areas) would be greater than one acre.

TVA also consulted with TDEC regarding the potential effects of the Proposed Action on a state-listed plant species, rough avens (*Geum laciniatum*), as described in Section 3.4.1.3 below. TDEC identified a mitigation measure to address these effects (Section 2.3). See Appendix A, Relevant Correspondence.

Finally, TVA consulted with the State of Tennessee Historic Preservation Officer (SHPO) on whether the Proposed Action would have adverse effects on sensitive cultural resources. The existing bridge has been assessed previously by TVA, as part of Section 110 (National Historic Preservation Act) compliance regarding the potential inclusion of the Wilbur project on the list of National Register for Historic Places (NRHP). The bridge lies on the edge of the Wilbur project review area and is not visible from Wilbur Dam. It is also outside the NRHP boundaries of Watauga Reservoir and not within view of Watauga Dam. TVA has found that the bridge lacks historic, architectural, and engineering significance, and the Project would not adversely affect historic properties. TVA also consulted with federally recognized Indian tribes regarding properties within the Project Area that may be of religious and cultural significance to them and eligible for the NRHP. See Appendix A, Relevant Correspondence.

TVA has provided notice of the proposal and the EA to potentially impacted residents, TVA employees, local and regional government officials, and other stakeholders to ensure that the public is aware of the Project, has an opportunity to review TVA's environmental analysis, and can comment on the Project and its potential effects. During the public review of the draft EA, TVA plans to notify and meet with the public and adjacent residents.

1.4 Scope of the Environmental Assessment

Pursuant to NEPA and the Act's implementing regulations promulgated by the Council on Environmental Quality (40 Code of Federal Regulations [CFR] 1500–1508), Federal agencies are required to evaluate the potential environmental impacts of any proposals for major federal actions. TVA prepared this EA to assess the potential consequences of TVA's Proposed Action on the environment and human health in accordance with NEPA and TVA's procedures for implementing NEPA (18 CFR 1318).

TVA has determined that the following resources are known to have the potential to be affected by the Proposed Action:

- Surface Water Quality
- Wetlands
- Floodplains
- Terrestrial Ecology (Zoology and Botany)
- Aquatic Ecology
- Threatened and Endangered Species
- Cultural Resources (Archaeological and Historic)
- Managed and Natural Areas
- Recreation
- Transportation
- Noise
- Socioeconomics and Environmental Justice

- Air quality
- Solid waste

TVA has determined that navigation is not an issue requiring detailed analysis. TVA has consulted with the U.S. Coast Guard, which has stated that a bridge permit is not required for this proposal. There is no commercial traffic on Wilbur Reservoir. Potential impacts to recreation boaters are discussed in Section 3.9, Recreation.

During this environmental review, TVA is analyzing the potential impacts to resources present at the location of the existing bridge and new bridge as well as in areas north and south of the bridgeway that would be affected by the realignment and construction of Wilbur Dam Road as it approaches the new bridge. TVA would also review potential impacts that may occur from the two construction laydown areas that would be located south of the bridge location along Wilbur Dam Road. Direct, indirect and cumulative impacts are described.

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CHAPTER 2 - ALTERNATIVES

2.1 Description of Alternatives

Preliminary internal scoping by TVA has determined that from the standpoint of the National Environmental Policy Act (NEPA), there are two alternatives that will be carried forward in the EA: the No Action Alternative and the Proposed Action Alternative - Wilbur Reservoir Bridge Replacement.

2.1.1. The No Action Alternative

Under the No Action Alternative, TVA would not build a new bridge and the existing bridge would remain in place. Its structural issues and uncertainty in the bridge foundations would continue to prevent it from safely carrying all normal highway loads.

2.1.2. TVA's Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Under this alternative, TVA would replace the existing bridge, Wilbur Reservoir Bridge, with a new concrete bridge aligned on the eastern side, or just downstream, of the existing bridge (see Figure 3 below). Based on initial project design, TVA would use five concrete spans (three spans at 110 feet in length and two spans at 85 feet in length) with four piers in the reservoir. The bridge construction would necessitate a slight realignment of Wilbur Dam Road on each side of the reservoir to accommodate the placement of the new bridge. Therefore, there would be areas of land disturbed from the new alignment on each side of bridge.

Activities would occur within a 13.9-acre Project Area (Figure 4), which would include the Wilbur Reservoir Bridge construction site and three temporary lay down areas in the vicinity of the bridge site to support construction activities (e.g., equipment placement, parking, storage). Laydown area # 1 would be approximately 0.3 acres in size and include a paved parking lot/picnic area located on the north side of the bridge. This laydown area would be used in initial phases of construction; a portion of the laydown area would be included in the new roadway approach to the bridge. Laydown areas #2 and #3 would be approximately 3.8 acres and 1.1 acres in size, respectively, and would be located on Wilbur Dam Road just south of the bridge site. Grading and approximately 2 acres of tree clearing would be needed to prepare laydown areas #2 and #3; cleared trees and vegetation would be removed by truck for disposal. The Project would avoid removing six trees identified as suitable summer roosting habitat for protected bat species in laydown area #2. See Appendix B for photographs of the three laydown areas.

Project activities are anticipated to begin in 2024. At this time, TVA estimates that new bridge construction would take approximately 10 to 11 months and demolition of the existing bridge would take approximately one to two months. After construction and opening of the new bridge, TVA would demolish the existing bridge, thereby minimizing the disruption of travel and access along Wilbur Dam Road.

New bridge construction and bridge demolition would include work in the reservoir. Coordination with TVA's River Management group would be needed to allow for limited times of lowered water elevation during new bridge construction for the drilled shafts and/or

during demolition/removal of the existing bridge. During these activities, TVA would draw down Wilbur Reservoir below its normal operating range of 1644 to 1648 feet to a reservoir elevation in the mid-1620s (feet) for a brief period (i.e., less than one day). However, for most of the time, TVA would maintain the reservoir water level within Wilbur's normal operating range.

A crane would be used during project activities, including for placing beams during construction of a new bridge and for disassembling the existing bridge during demolition. The crane would be situated either on a barge in the reservoir or on a bulkhead installed along the shoreline of the reservoir. A bulkhead is a platform area created by a retaining wall with the reservoir on one side and soils and fill materials on the other, from which construction materials and equipment may be loaded on to a barge(s). The installation of a bulkhead on the shoreline would involve the temporary placement of fill materials into the reservoir and on the bank of the reservoir adjacent to the bridge location, affecting approximately 0.1 acre. Some grading of the slope may be required to allow crane access. The bulkhead and fill materials would be removed after the completion of the project and the shoreline would be regraded and reseeded to its original condition.

TVA estimates that bridge demolition would initially involve cutting and removing the concrete decking of the existing bridge. Because lead paint that is present on the steel superstructure of the bridge is considered a hazardous waste, TVA would require that the contractor's demolition plan for removal of the steel superstructure portion of the bridge be done without using explosives to prevent dispersal of lead paint chips into the environment. The steel superstructure of the bridge would be removed by crane and placed on adjacent land. On land, the steel superstructure would be disassembled and transported by truck offsite for appropriate disposal; steel with lead paint would be recycled and therefore would not be managed as a hazardous waste. Finally, the four concrete piers would be demolished down to the mudline of the reservoir (with the use of explosives or other deconstruction means) and all debris would be removed from the channel bottom. The demolition plan will be finalized by TVA's construction contractor and would comply with all permits and commitments. Residents would be alerted prior to demolition activities.

During construction, traffic on Wilbur Dam Road would remain open, although it is anticipated that total closures would be short term (less than an hour), with accommodations for emergency vehicles. Single-lane closures are also likely and could last for a longer period (several days or more).

Clearing and/or grading would be needed to stage the laydown areas. After construction and demolition activities are completed, the laydown areas and other disturbed areas would be graded, covered with topsoil, and seeded to establish permanent vegetative cover or otherwise permanently stabilized.



Figure 3. Depiction of a new concrete bridge alternative, aligned on the east side, or just downstream, of the existing Wilbur Reservoir Bridge



Figure 4. Project Area: Areas to be impacted by the Proposed Action (bridge location and lay down areas)

2.1.3. Alternatives Considered but Eliminated from Further Discussion

Prior to conducting the bridge study, TVA considered whether the existing bridge could be repaired to an improved condition. To repair the bridge and provide for normal highway loads, TVA determined that approximately 55 members of steel trusses must be strengthened. Because the bridge is fracture critical, repairing and/or replacing tension members under load can be a complicated and risky undertaking. This would still leave many truss members that are over a century old and a concrete deck that would need to be replaced within the next decade. In addition, repairing the bridge would require extensive sand blasting and/or use of chemical removal methods to remove lead paint from the existing structure, which presents an unacceptable environmental risk to reservoir waters below the bridge. Considering these factors, TVA determined that replacement of the bridge with a safer, wider roadway was preferable to continued long-term maintenance of the existing bridge. The new bridge would not be fracture critical and thus would allow for a standard two-year inspection frequency rather than require more frequent inspections.

TVA engineers, when reviewing potential replacement options, identified three other bridge replacement alternatives in the study. Engineers considered both concrete and steel girder options for alignments on the east side and west side of the existing structure. The horizontal and vertical alignment of Wilbur Dam Road was a key constraint to the type of

structure that can be constructed, due to several curves and utility poles that would complicate beam delivery.

The presence of a local water utility force main and pump house on the west side of the existing structure was also a constraint that complicated construction of a new bridge to the west of the existing bridge. The western alignment would also have extended the length of the bridge compared to the eastern alignment. As noted above, TVA eliminated repair of the existing bridge as an alternative because of the age and condition of the existing bridge and the lack of information about its structural foundations. Without structural drawings of the foundations, TVA would be required to conduct excavation and testing of the foundations, which would be costly and have potential environmental impacts. Repair of the existing bridge, therefore, was determined not to be a reasonable alternative.

2.2 Comparison of Alternatives

Table 2-1 compares the potential impacts of the No Action Alternative and the Proposed Action Alternative.

Table 2-1. Summary and Comparison of Alternatives by Resource Area

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Surface Water Quality	No direct surface water impacts. Indirect surface water impacts could result if degradation of the bridge were to result in limiting access to Watauga Dam upstream of the bridge crossing, which requires personnel be present for operation and maintenance.	Short-term, minor impacts that are not anticipated to affect water quality of downstream waters. Terms and conditions of all required federal and state permits would be adhered to, including proper implementation of a Storm Water Pollution Prevention Plan (SWPPP) and associated best management practices.
Wetlands	No impacts to wetlands. No wetlands currently exist within the Project Area.	No impacts to wetlands. No wetlands currently exist within the Project Area.
Floodplains	No impacts to floodplains.	No significant impact on floodplains and their natural and beneficial values with implementation of mitigation measures.
Terrestrial Ecology - Zoology	No impacts to terrestrial zoology. Current conditions would continue.	Direct effects to immobile individuals during the time of habitat removal; short-term, minor impacts associated with displaced species during the Project; no impacts to migratory bird populations.
Terrestrial Ecology - Botany	No impacts to terrestrial botany. Current conditions would continue.	Minor impacts associated with removal of common vegetation; no unique or important habitat present.
Aquatic Ecology	No impacts to aquatic ecology. Current conditions would continue.	Short-term, minor impacts associated with the potential for increased erosion, siltation, loss of instream habitat during construction activities.
Threatened and Endangered Species	No impacts to threatened and endangered species.	With implementation of conservation measures, including avoiding suitable summer roosting habitat, significant impacts to federally listed or protected

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
		bat species are not anticipated. Impacts to three plants of the state special concern, rough avens, would be avoided by transplanting them to another appropriate habitat location identified along Wilbur Reservoir. No impacts to aquatic species.
Cultural Resources	No impacts to cultural resources.	TVA would avoid adverse effects to potentially eligible site 40CR266 (a stone feature associated with a dormitory for workers during construction of Watauga Dam) using mitigation measures to ensure the site is not disturbed; there would be no vegetation clearing, vehicle use, or ground disturbing activities in the sensitive area. TVA is consulting with SHPO and Tribes on its initial finding that the Project would not adversely affect any properties listed in or eligible for listing in the NRHP.
Managed and Natural Areas	No impacts to managed and natural areas.	Short-term, minor impacts to managed/natural areas that overlap the Project Area due land disturbing activities associated with construction activities. After construction, disturbed areas would be graded, covered with topsoil, and seeded to establish permanent vegetative cover or otherwise permanently stabilized. Short-term, minor indirect impacts to natural/managed areas that are within 0.5 miles of the Project Area.
Recreation	No impacts to recreation. Over a period of time, access to recreation sites could be jeopardized if no action is taken to address the bridge's condition.	Short-term, minor impacts to recreational facilities due to noise, single lane closures of Wilbur Dam Road and the temporary closure of the Wilbur Reservoir Overlook Area. Long-term impact would result from the reduced size of the Overlook Area, when reopened. Short-term minor impacts to recreational boating and fishing during construction activities. Long-term beneficial impacts would result from the new bridge allowing safer, long-term access to the area's recreation sites.
Transportation	Long-term impacts given the condition of bridge would continue to deteriorate and potentially limit access to TVA's Watauga Dam and	Short-term, minor adverse impacts due to temporary traffic disruption. Long-term beneficial impacts from

Resource Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
	Hydro Plant, the nearby community, and recreation sites.	improved safety and reliability of the bridge.
Noise	No impacts to noise.	Intermittent, moderate to high adverse impacts to residences near laydown areas #2 and #3 throughout the Project timeline during daytime hours. Intermittent, minor impacts to TVA's Watauga Dam Campground throughout the Project timeline during daytime hours.
Socioeconomics and Environmental Justice	No direct impacts to socioeconomics and environmental justice. Future deficiencies of the bridge, if not addressed, have the potential to severely affect TVA operations of Watauga Dam and Hydro Plant, residents in the nearby community, visitors to recreations sites, and TVA employees at Watauga Dam and Hydro Plant.	Short-term, minor impacts to nearby communities if routes to haul construction debris utilize surrounding local roadways. Environmental justice community in the vicinity of the Project Area would bear greater impacts from transportation, noise, and visual impacts due to their proximity to construction activities; these impacts would be temporary, intermittent, and only occur during daytime hours. The community would benefit in the long term from the new bridge.
Air Quality	No impacts to air quality.	Short-term, minor impacts would result from fugitive dust and emissions from equipment and vehicles during construction and demolition activities.
Solid Waste	No impacts to solid waste.	Minor impacts, as hazardous (lead paint) and nonhazardous solid wastes would be managed in accordance with all applicable state and federal regulations.

2.3 Identification of Mitigation Measures

In addition to the requirements of any necessary permits, which include mitigation measures and best management practices (BMPs), TVA would implement numerous measures to avoid, minimize, or resolve adverse impacts on the environment. Shoreline stabilization and construction activities would be subject to environmental requirements of the State of Tennessee and applicable regulations. Construction-related BMPs would be critical to ensuring that environmental resources are not affected.

BMPs include the appropriate measures to control erosion, stabilize disturbed areas, minimize storm water impacts, and reduce sedimentation of stream and/or reservoir waters. BMPs also ensure that construction-related waste is properly contained so that environmental impacts are avoided. All wastes would be evaluated and managed in accordance with applicable waste management laws and regulations.

The following measures were identified by TVA during the environmental review process and would be implemented to mitigate potential adverse effects of the Proposed Action:

- *Surface Water Quality / Aquatic Ecology.* To avoid impacts to a stream channel located below Wilbur Dam Road on the south side of the reservoir crossing within the Project Area, TVA would require the contractor to maintain a 50-foot buffer on either side of the naturally flowing (not culverted) portion of the stream feature. TVA would avoid impacting an ephemeral wet weather conveyance within the proposed laydown area #2 by roping the area off; no grading, filling, or clearing would occur within the roped area. For any clearing or grading near the ephemeral stream, TVA would require the use of standard BMPs to prevent sedimentation from entering the ephemeral stream.
- *Threatened and Endangered Species (Zoology).* TVA would require the construction contractor to avoid removing six trees identified as suitable summer roosting habitat for federally listed bat species. Several activities associated with the proposed project, including tree removal, were addressed in TVA's 2018 programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with ESA Section 7(a)(2). For those activities with potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on page 5 of the TVA Bat Strategy Project Screening Form (see Appendix C) and would be reviewed/implemented as part of the Project.
- *Botany.* TVA would physically dig up the three special concern rough avens plants in the Project Area, preferably in the fall, and place them in containers. TVA would then immediately plant them in an appropriate habitat already identified along Wilbur Reservoir.
- *Floodplains.* If not located on a barge in the reservoir, the crane used to demolish the existing bridge would be parked at one of the three laydown areas when not in use. Bridge debris would be hauled off site for disposal at a location outside 100-year floodways.
- *Cultural Resources.* To avoid adverse effects on the potentially eligible site 40CR266 (a stone feature associated with a dormitory for workers during construction of Watauga Dam), TVA would flag the western portion of the laydown area #3 with high visibility flagging tape prior to construction, recording this as a "sensitive area" on design drawings, and requiring the construction crew to exclude the sensitive area from use. These measures would ensure no vegetation clearing, vehicle use, or ground disturbing activities occur in the sensitive area.
- *Recreation.* TVA would coordinate with Watauga Dam Campground to ensure the potential for recreational impacts are minimized.
- *Managed and Natural Areas.* TVA would coordinate with individual land managers of managed/natural areas that are within 0.5 miles of the Project Area to ensure potential impacts are minimized.
- *Air.* To minimize fugitive dust mobilization, TVA would require contractors to keep construction equipment properly maintained and to use BMPs (such as covered

loads and wet suppression) to prevent the spread of dust, dirt, and debris. These methods may include wetting equipment and laydown areas, covering waste or debris piles, using covered containers to haul waste and debris, and cleaning paved roads, including Wilbur Dam Road, daily until construction and demolition activities are complete.

- TVA would provide periodic updates to residents of the small community on Lookout Lane and Raven Rock Creek Road, and the Watauga Dam Campground. The residents would also be informed prior to demolition activities.

2.4 The Preferred Alternative

The Proposed Action Alternative - Wilbur Reservoir Bridge Replacement is TVA's preferred alternative. The Proposed Action Alternative best meets TVA's purpose and need.

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CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

This chapter contains a description of the current conditions (affected environment) of various environmental resources in the Project Area that could be affected by the replacement of the bridge. Potential environmental effects of both alternatives on each of the identified resources are also analyzed in this chapter. TVA will analyze direct, indirect, and cumulative impacts associated with the two alternatives. Direct impacts are effects caused by a proposed action that occur at the same time and place (on site), whereas indirect impacts are effects caused by a proposed action but are removed in time or space (off site). Cumulative impacts are addressed at the end of this chapter.

3.1 Surface Water Quality

3.1.1. Affected Environment

The proposed Project would consist of replacing the existing bridge, Wilbur Reservoir Bridge, over Wilbur Reservoir with a new bridge just downstream of the existing bridge. The bridge crossing is the only access to Watauga Dam, which is approximately one mile upstream. The Project Area for the new bridge construction would consist of the new bridge location across the reservoir, new roadway on land routed to tie into the existing Wilbur Dam Road on either side of the reservoir crossing and lay down areas. Once bridge construction is complete, demolition and removal of the existing bridge would occur. The Project Area associated with the existing bridge removal would comprise the reservoir area traversed by the old bridge and the immediate land-based roadway area that facilitates bridge access. An aquatic resources field survey conducted in January 2023 identified three surface water features within the Project Area: Wilbur Reservoir crossed by the existing and proposed new bridge; one perennial stream channel at the south end of the Project Area culverted below Wilbur Dam Road; and an ephemeral wet weather conveyance within the laydown area #2 (see Appendix D).

The proposed Project is in Carter County, Tennessee, in the Blue Ridge ecoregion. The Project Area crosses the Wilbur Reservoir impoundment of the Watauga River, which is located within the Watauga River watershed (06010103 - hydrologic unit 8-digit code). Wilbur Reservoir comprises a two-mile stretch of the Watauga River from mile marker 34 to 36.5 between Wilbur and Watauga Dams, covering 72.5 acres of surface water area with a total of 3.6 miles of shoreline. Tennessee Department of Environment, Division of Water, maintains two monitoring points on Wilbur Reservoir. One is located immediately downstream of the existing bridge location and the second is located immediately upstream of Wilbur Dam. These monitoring stations are used to assess water quality of the reservoir in relation to the designated use classification. Wilbur Reservoir has designated uses for domestic water supply, industrial water supply, fish and aquatic life, recreation, livestock watering and wildlife, irrigation, and a naturally reproducing trout stream (TDEC 2019). Data collected from these stations indicate Wilbur Reservoir meets all water quality standards for its designated use classification and is considered fully attaining (TDEC DWR 2022).

Precipitation in the general area of the proposed project averages about 45 inches per year. The wettest month is July with approximately 5.4 inches of precipitation, and the driest month is October with 2.4 inches. The average annual air temperature is 56 degrees Fahrenheit, ranging from an annual average of 44 to 67 degrees Fahrenheit (US Climate Data 2023). Stream flow varies with rainfall and averages about 22.78 inches of runoff per year, i.e., approximately 1.68 cubic feet per second, per square mile of drainage area (USGS 2008).

The federal Clean Water Act requires all states to identify waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards and to establish priorities for the development of limits based on the severity of the pollution and the sensitivity of the established uses of those waters. States are required to submit reports to the Environmental Protection Agency (EPA) listing impaired streams and water bodies and identifying the source or cause. No watercourse within the Project Area is identified as not meeting its use classification. However, the Watauga River immediately downstream of Wilbur Dam is listed as impaired due to the dam causing temperature deviations in the downstream waters. Further downstream, the Watauga River experiences impairment associated with high density urban landscape as it flows through the township of Hunter and enters Elizabethton, Tennessee (TDEC 2022).

3.1.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, the proposed Project would not be implemented. No bridge construction or demolition would occur; therefore, no direct surface water impacts would be anticipated. The bridge's structural integrity would remain in its currently degraded condition and monitored. Indirect surface water impacts could result from limiting access to Watauga Dam upstream of the bridge crossing, which requires personnel be present for operation and maintenance.

TVA's Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Under this alternative, the Wilbur Reservoir Bridge would be replaced by a new bridge constructed downstream and parallel to the existing bridge. The new concrete bridge would be supported by four piers in the reservoir. Placement of these support structures in a regulated aquatic feature, such as Wilbur Reservoir, requires adherence to CWA permits that ensure no more than minimal impacts to the aquatic environment. TVA would obtain coverage and comply with the terms and conditions of a CWA Section 404 permit for construction of the bridge supports in the reservoir and associated temporary impacts for the installation of a temporary bulkhead. In addition, an aquatic resource alteration permit (ARAP) would be required in compliance with Tennessee water quality regulations and antidegradation policy. The ARAP application review and approval process ensures the project does not result in significant degradation to regulated waters. The ARAP also serves as Water Quality Certification for the federal CWA 404 permit, ensuring the federal permit is issued in alignment with state water regulations. This certification meets CWA Section 401 obligations.

Construction activities, including lay down areas, would result in approximately 13.9 acres of disturbance. Construction activities have the potential to temporarily affect surface water via storm water runoff. TVA would comply with all appropriate federal and state permit requirements, including obtaining and adhering to the terms and conditions of a general construction storm water permit. This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) to ensure sedimentation and other debris in site run-off is sufficiently trapped and collected prior to discharge to surface waters. Appropriate best management practices (BMPs) would be followed, and all proposed project activities would be conducted in a manner to ensure erosion, waste, and construction debris is contained, and the introduction of sediment or pollutants to the receiving waters is adequately minimized. The SWPPP would identify specific BMPs to address construction-related activities necessary for implementation to protect the receiving surface waters. These BMPs, as described in the Tennessee Erosion and Sediment Control Handbook (TDEC 2012) and *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA 2022), would be used to sufficiently minimize contamination of surface water in the Project Area. Similarly, equipment washing and dust control discharges would be handled in accordance with BMPs described in the SWPPP for water-only cleaning.

As described above, TVA would use a crane during construction of the new bridge and for disassembling the existing bridge during demolition. The crane would be situated either on a barge in the reservoir or on a pad or bulkhead installed along the shoreline of the reservoir. Use of barge for crane access would have negligible surface water impacts. The installation of a bulkhead on the shoreline would involve the temporary placement of gravel fill into the reservoir and on the bank of the reservoir adjacent to the bridge location, affecting approximately 0.1 acre. Some grading of the slope may be required to allow crane access. Bulkhead installation and removal would result in minor temporary disturbance to shoreline soils and sediment on the reservoir bottom. After completion of the project, the bulkhead would be removed, and the shoreline and reservoir would be restored to its original condition. Restoration of the impacted area would similarly cause temporary minor disturbance to soils comprising the river bottom and shoreline as fill material is removed and the area is reestablished.

The existing bridge would be demolished after the new bridge opens to vehicular traffic. The concrete decking would first be cut and removed from the bridge. The steel superstructure of the bridge would be removed by crane and placed on adjacent land. Removal of the steel superstructure in this manner is necessary to prevent dispersal of lead paint chips into the environment. On land, the steel superstructure would be disassembled and transported by truck offsite for appropriate disposal. Finally, TVA intends to demolish the four concrete piers of the existing bridge down to the mudline of the reservoir potentially with the use of explosives or other de-construction means. Once the concrete piers are reduced to rubble, the debris would be removed from the channel bottom using the crane with a clamshell attachment. Pier demolition and removal of debris would result in moderate temporary disturbance to sediment on the reservoir bottom.

The bridge demolition would be covered under a CWA Section 404/401 and ARAP to ensure proposed demolition activities are carried out in manner that results in no more than minimal and temporary disturbance to surface water. In addition, the construction general permit and associated SWPPP/BMPs would ensure disturbance resulting from the bridge demolition is managed in accordance with water quality regulations.

No disturbance is proposed to the linear stream feature culverted below Wilbur Dam Road on the south side of the reservoir crossing within the Project Area. The roadbed and stream feature in this location shall remain in its current culverted condition. A 50-foot buffer on either side of the naturally flowing (not culverted) portion of this stream feature shall be avoided by all construction equipment and activities (TVA 2022). No impacts to this stream are anticipated.

TVA would also not impact the ephemeral wet weather conveyance that is located within laydown area #2. The water feature would be flagged and would not be disturbed (e.g., graded, filled, cleared) during construction, and BMPs would be applied in the vicinity of the feature to minimize sedimentation.

Adherence to the terms and conditions of all required federal and state permits, including proper implementation of the SWPPP and associated BMPs, is expected to result in only minor temporary impacts to surface waters. These minor temporary impacts are not anticipated to have long term effects on the current fully attaining status of the surface water use classifications for Wilbur Reservoir, nor affect the water quality of downstream waters.

3.2 Wetlands

3.2.1. Affected Environment

Wetlands are those areas inundated or saturated by surface or groundwater such that vegetation adapted to saturated soil conditions are prevalent. Examples include bottomland forests, swamps, wet meadows, isolated depressions, and fringe wetland along the edges of watercourses and impoundments. Wetlands provide many societal benefits including toxin absorption and sediment retention for improved downstream water quality, storm water attenuation for flood control, shoreline buffering for erosion protection, and provision of fish and wildlife habitat for commercial, recreational, and conservation purposes. Therefore, a wetland assessment was performed to ascertain wetland presence, condition, and extent to which wetland functions may be provided on site.

A field survey was conducted on January 17, 2023, along Wilbur Dam Road within the proposed Project Area, around the periphery of the existing Wilbur Reservoir Bridge, and within the proposed laydown areas. No wetlands were identified within the Project Area. The Soil Survey Geographic Database (SSURGO) indicates generally well-draining soil that is not hydric. One riverine and two lacustrine National Wetlands Inventory (NWI) features are mapped within the Project Area. Aerial imagery indicates majority upland forest with marginal residential land use. United States Geology Survey (USGS) topography indicates relatively gentle slopes within the Project Area with steeper grades along its edges.

Wetland determinations were performed according to US Army Corps of Engineers (USACE) standards (Environmental Laboratory 1987, USACE 2012), which require documentation of hydrophytic vegetation (Lichvar et al. 2016), hydric soil, and wetland hydrology. No hydric soil, wetland hydrology, or hydrophytic vegetation were identified in combination during the field survey. Therefore, no wetlands are present, and no wetland impacts are anticipated to result from the Project activities.

3.2.2. Environmental Effects

Activities in wetlands are regulated under Section 401 and 404 of the Clean Water Act (CWA) and are addressed by Executive Order (EO) 11990 (Protection of Wetlands). Section 401 requires water quality certification by the state for projects permitted by the federal government. Section 404 implementation requires activities resulting in the discharge of dredge or fill into Waters of the U.S. (WOTUS) to be authorized through a Nationwide General Permit or Individual Permit issued by the USACE. EO 11990 requires federal agencies to minimize wetland destruction, loss, or degradation, and preserve and enhance natural and beneficial wetland values, while carrying out agency responsibilities.

The No Action Alternative

Under the No Action Alternative, TVA would not build a new bridge and the existing bridge would remain in place. As no wetlands currently exist within the Project Area, no wetlands would be affected.

TVA's Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

As, no wetlands currently exist within the Project Area, no wetlands would be affected. Best management practices, including erosion control measures, would be in place to ensure sedimentation or other indirect wetland impacts do not affect wetland features downstream of the construction site (TVA 2022). Therefore, with wetland avoidance and best management practices in place, no significant wetland impacts are anticipated to result from the Project activities.

3.3 Floodplains

3.3.1. Affected Environment

A floodplain is the relatively level land area along a stream or river that is subject to periodic flooding. The area subject to a one-percent chance of flooding in any given year is normally called the 100-year floodplain. The area subject to a 0.2-percent chance of flooding in any given year is normally called the 500-year floodplain. It is necessary to evaluate development in the floodplain to ensure that the project is consistent with the requirements of EO 11988, Floodplain Management.

TVA reservoirs have either power storage or flood storage or both. Power Storage is allocated to a range of elevations and water occupying space in that range is used to generate electric power through a dam's hydraulic turbine generators. Flood Storage is allocated to a range of elevations and water occupying space within that range is used to store flood water during a flood or high-flow rain event. Some of TVA's dams are able to be surcharged. Surcharge is the ability to raise the water level behind the dam above the top

of the spillway gates. Surcharge can be sustained only for a short period of time during a flood. To control flood-damageable development on TVA lands, TVA uses a concept known as the Flood Risk Profile (FRP). The FRP is the elevation of the 500-year flood that has been adjusted for surcharge at the dam.

The proposed Project would be located between Watauga River miles 34.5 and 34.9, left and right descending bank, on Wilbur Reservoir, in Carter County, Tennessee. At this location, the 100- and 500-year flood elevations of Wilbur Reservoir would both be 1650.0 feet. The Watauga River floodplain is shown on Carter County Flood Insurance Rate Map Panel Number 47019C0225E (effective September 26, 2008).

3.3.2. Environmental Effects

As a federal agency, TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is "...to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (EO 11988, Floodplain Management). The EO is not intended to prohibit floodplain development in all cases, but rather to create a consistent government policy against such development under most circumstances (U.S. Water Resources Council 1978). The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

EO 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input was reinstated in May 2021. However, implementation of EO 13690 is still in development at the national level. TVA is working with other federal agencies to develop consistent implementing plans for these EO requirements. When those implementing plans are finalized, TVA would incorporate floodplain analysis with respect to EO 13690, in addition to EO 11988. Depending upon the results of these inter-agency efforts, TVA may update the floodplain implementing plan in subsequent NEPA analysis.

The No Action Alternative

Under the No Action Alternative, TVA would not build a new bridge and the existing bridge would remain in place. There would be no impact to floodplains.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

The new bridge approaches and the three laydown areas would be located outside the floodplain. A small portion of the retaining wall at the south end of the new bridge would be located within the 100-year Watauga River floodplain. Consistent with EO 11988, roads, bridges and retaining walls for roadways are considered repetitive actions in the 100-year floodplain that should result in only minor impacts. To minimize adverse impacts, standard BMPs would be used. A crane would be used during bridge construction and to remove the existing bridge steel superstructure. To minimize adverse impacts, the crane would be parked at either of the three laydown areas when not in use. Bridge debris would be hauled

off site for disposal at an approved disposal facility that is located outside 100-year floodways.

By implementing the mitigation measures listed in Chapter 2, the proposed bridge replacement and roadway realignment would have no significant impact on floodplains and their natural and beneficial values.

3.4 Terrestrial Ecology

3.4.1. Affected Environment

3.4.1.1. Zoology

The Project Area contains a matrix of riparian areas, small tracts of upland pine/mixed deciduous forest and forest edge habitat, mowed grass areas, and paved roads. The area is surrounded by the Cherokee National Forest.

The forested areas within the Project Area are comprised of largely pine trees with some deciduous hardwood species, shrubs, and cedars and that provide habitat for common birds such as Carolina chickadee, Carolina wren, cedar waxwings, chipping sparrow, eastern blue bird, eastern towhee, golden crowned kinglet, northern cardinal, northern flicker, northern mockingbird, prairie warbler, pine warbler, red tailed hawk, song sparrow, tufted titmouse, and white-throated sparrow (National Geographic 2002). Mammals found in these habitats include common raccoon, white-tailed deer, eastern gray squirrel, and Virginia opossum (Whitaker 1996). Common reptile species also use similarly disturbed habitats including American toad, eastern box turtle, eastern garter snake, and Fowler's toad (Powell et al. 2016).

The riparian area along the reservoir, may provide suitable habitat for a multitude of amphibian and reptilian species. Amphibians likely to use the area include American bullfrog, Cope's gray tree frog, eastern newt, northern cricket frog, southern leopard frog, and upland chorus frog. Reptiles utilizing these wet areas and the surrounding habitat include garter, northern water, rat and ring-necked snakes (Powell et al. 2016, Gibbons and Dorcas 2005).

Two caves are known within three miles of the Project Area. The nearest cave is approximately 1.6 miles away. No caves were observed during the field survey.

Review of the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) tool in December 2022, identified eight migratory bird species of conservation concern that have the potential to occur within the Project Area: bald eagle, bobolink, chimney swift, eastern whip-poor-will, prothonotary warbler, red-headed woodpecker, rusty blackbird, and wood thrush.

See Threatened and Endangered Species (Terrestrial Animals) section for discussion on bald eagles.

Bobolinks migrate through Tennessee in the spring and fall. Bobolinks migrate in large aggregations stopping along river, shores, and marshes to feed on wetland vegetation

(Renfrew et al. 2020). Typical migratory stopover habitat for bobolinks is not present within the Project Area.

Chimney swifts are summer residents in Tennessee and use chimneys in more urban areas as nesting sites and communal roosts (Palmer-Ball 1996). No chimney-like structures exist within the Project Area.

Eastern whip-poor-will are summer residents in Tennessee that have shown preference for nesting in mixed forest types above 610 m (~2000 feet) (Cink et al 2020). Mixed-deciduous forest is present within the Project Area, but at approximately 500m elevation (~1650 feet).

Prothonotary warblers are a summer resident in Tennessee and are typically found near water where nests are built in cavities over or near slow moving water (Walkinshaw 1953). Suitable breeding habitat for prothonotary warbler is not present within the Project Area.

Red-headed woodpeckers use a variety of treed habitats but show preference for forested areas exhibiting more openness and a high number of tree snags available (Reller 1972). Red-headed woodpecker habitat is present within the mature forest sections of the Project Area.

Rusty blackbirds are winter residents in Tennessee and utilize forested wetland habitats (Greenberg & Matsuoka 2010). Suitable habitat for rusty blackbirds is not present within the Project Area.

Wood thrushes are summer residents in Tennessee that are associated with larger tracts of mature mixed-deciduous forests with open forest floors (Evans et al. 2020). The forested areas adjacent to the Project Area are large enough that wood thrushes may use the area as breeding habitat. The forested areas within the Project Area would not likely support breeding wood thrushes, as it is largely disturbed edge habitat.

3.4.1.2. Botany

The proposed project would occur in the Southern Sedimentary Ridges Level IV ecoregion (Griffith et al. 1998). The Southern Sedimentary Ridges ecoregion is comprised of low rounded mountains, some with long linear ridges and steep slopes. Appalachian oak forest is prevalent with mixed oaks, hickory, pine, poplar, birch, and maple, mesophytic forests, forests that are adapted to neither a particularly dry nor particularly wet environment, that include beech, buckeye, basswood, and tulip poplar, and northern hardwoods that include maple, birch, beech, and hemlock. Land cover is forested with large areas of public land and land use is mainly forestry, hunting, and recreation.

Field surveys were conducted in January 2023 to document plant communities, infestations of invasive plants, and to search for possible threatened and endangered plant species in areas where work would occur. Most areas along the proposed bridge replacement project and laydown areas were visited during the surveys. Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types observed during field surveys can be classified as a combination of deciduous forest, mixed evergreen, shrubland, and herbaceous vegetation. No forested areas in the Project Area had structural characteristics indicative of old growth forest stands (Leverett 1996). The plant

communities observed on-site are common and well represented throughout the region. Vegetation in the Project Area and laydown areas are characterized by three main types: forest (67 percent) herbaceous (29 percent), and shrubland (4 percent).

Deciduous forest, where deciduous trees account for more than 75 percent of total canopy cover, is the most common forest type and constitutes about 60 percent of the total forest cover in the Project Area. Deciduous forests are dominated by a variety of tree species including American sycamore (*Platanus occidentalis*), black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), box elder (*Acer negundo*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and tulip poplar (*Liriodendron tulipifera*) with the evergreen eastern white pine (*Pinus strobus*). Herbaceous plants and woody vines observed included cat greenbrier (*Smilax glauca*), Christmas fern (*Polystichum acrostichoides*), Japanese honeysuckle (*Lonicera japonica*), Japanese stiltgrass (*Microstegium vimineum*), white avens (*Geum canadense*), and yellow crownbeard (*Verbesina occidentalis*). Deciduous forests in the project area have trees that range between 3- and 18-inches diameter at breast height (dbh).

Mixed evergreen-deciduous forest, defined as stands where both evergreen and deciduous species contribute between 25-75 percent of total canopy cover, accounts for about 40 percent of total forest cover for the entire Project Area. In general, these forest types are similar to the deciduous forests described above, with a larger percentage of white pine and to a lesser extent, eastern hemlock (*Tsuga canadensis*) and American holly (*Ilex opaca*). Herbaceous species and woody vines included Christmas fern, Japanese stiltgrass, poison ivy (*Toxicodendron radicans*), ragwort (*Packera* sp.), roundleaf greenbrier (*Smilax rotundifolium*), and sedge (*Carex* sp.). Mixed evergreen forests in the Project Area have trees that average 2 feet dbh.

Herbaceous vegetation is characterized by greater than 75 percent cover of forbs and grasses and less than 25 percent cover of other types of vegetation. The majority of this habitat type occurs around roads and parking lots. Most of these sites are dominated by plants indicative of early successional habitats including some non-native species. Early successional areas with naturalized vegetation contain herbaceous species and vines like broomsedge (*Andropogon virginicus*), goldenrod (*Solidago* sp.), hoary mountain mint (*Pycnanthemum incanum*), Japanese honeysuckle, Japanese stiltgrass, poison ivy, St. Johnswort (*Hypericum* sp.), tall thimbleweed (*Anemone virginiana*), and yellow crownbeard. Areas of emergent wetlands were present in the Project Area. See the Wetlands section (3.2) for species indicative of those areas.

Shrubland is defined as shrubs generally greater than 0.5 meters tall with individuals or clumps overlapping to not touching (generally forming more than 25% cover, trees generally less than 25% cover). This habitat type occurs along the southwestern and northern edges of Wilbur Reservoir Bridge. Shrubs found included black raspberry (*Rubus occidentalis*), elderberry (*Sambucus canadensis*), ninebark (*Physocarpus opulifolius*), swamp rose (*Rosa palustris*), tag alder (*Alnus serrulata*), and wineberry (*Rubus phoenicolasius*); scattered trees found included American sycamore, red maple, and tulip poplar. Herbaceous species and woody vines included Christmas fern, cutleaf coneflower (*Rudbeckia laciniata*), Japanese stiltgrass, roundleaf greenbrier, roundleaf ragwort

(*Packera obovata*), and yellow crownbeard. Three individuals of the special concern rough avens (*Geum laciniatum*) are found in this community.

Executive Order (EO) 13112 directed TVA and other federal agencies to prevent the introduction of invasive species (both plants and animals), control their populations, restore invaded ecosystems and take other related actions. EO 13751 amends EO 13112 and directs actions by federal agencies to continue coordinated federal prevention and control efforts related to invasive species. This order incorporates considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into federal efforts to address invasive species; and strengthens coordinated, cost efficient federal action. Some invasive plants have been introduced accidentally, but most were brought here as ornamentals or for livestock forage. Because these robust plants arrived without their natural predators (insects and diseases) their populations spread quickly across the landscape displacing native species and degrading ecological communities or ecosystem processes (Miller 2010). No federal-noxious weeds were observed, but some non-native invasive plant species were observed throughout the Project Area. Invasive species present across some portions of the landscape include Japanese honeysuckle, Japanese stiltgrass, and wineberry. During field surveys, invasive plants were found scattered in sections of herbaceous, deciduous, mixed evergreen, and shrubland vegetation types.

3.4.2. Environmental Effects

3.4.2.1. Zoology

The No Action Alternative

Under the No Action Alternative, TVA would not build a new bridge and the existing bridge would remain in place. Terrestrial wildlife and their habitats would not be impacted.

The Proposed Action Alternative - Wilbur Reservoir Bridge Replacement

Under this alternative, TVA would replace the existing bridge, Wilbur Reservoir Bridge, with a new concrete bridge aligned on the eastern side, or just downstream, of the existing bridge. Based on initial project design, TVA would use five concrete spans with four piers in the reservoir. The bridge construction would necessitate a slight realignment of Wilbur Dam Road on each side of the reservoir to accommodate the placement of the new bridge. Therefore, there would be areas of land disturbed from the new alignment on each side of bridge. New bridge construction and bridge demolition would include work in the reservoir. Construction laydown areas would be created by tree clearing (approximately 2 acres).

The Project would result in displacement of any wildlife (primarily common, habituated species) currently using the area. Direct effects to some individuals could occur if those individuals are immobile during the time of habitat removal (e.g., during breeding/nesting or hibernation seasons). Habitat removal likely would disperse mobile wildlife into surrounding areas in attempts to find new food resources, shelter, and to reestablish territories. Due to the amount of similarly suitable habitat in areas immediately adjacent to the Project Area, populations of common wildlife species likely would not be impacted by the Project actions.

The USFWS IPaC tool identified eight migratory birds of conservation concern that could occur within the Project Area: bald eagle, bobolink, chimney swift, eastern whip-poor-will, prothonotary warbler, red-headed woodpecker, rusty blackbird, and wood thrush.

See the Threatened and Endangered Species (Zoology) section 3.6.1.1 for discussion on bald eagles. Breeding and foraging habitat does not exist for chimney swift within the Project Area. Eastern whip-poor-will breeding habitat is not present within the Project Area. Within the forested areas in the Project Area, mature stands of trees and snags exist that may provide suitable breeding habitat for the red-headed woodpecker. The forested area within the Project Area would not likely support breeding wood thrushes. Migratory stopover habitat for bobolinks is not present within the Project Area. Breeding habitat is not present for prothonotary warbler. Overwintering habitat is not present for rusty blackbirds. Tree removal actions are proposed to begin in January 2024 when red-headed woodpeckers may still be on the landscape during the winter, but individuals would be expected to be able to flush due to any disturbance to nearby suitable habitat. The proposed project actions are not expected to impact populations of migratory bird species.

3.4.2.2. Botany

The No Action Alternative

Under the No Action Alternative, areas within the proposed project and access roads would remain in their current condition. Thus, adoption of the No Action Alternative would not affect plant life because no project-related work would occur. Changes to local plant communities resulting from natural ecological processes and human-related disturbance would continue to occur, but the changes would not result from the proposed project. Therefore, there would be no direct, indirect, or cumulative impacts to plant life under the No Action Alternative.

The Proposed Action Alternative - Wilbur Reservoir Bridge Replacement

Adoption of the Action Alternative would not significantly affect the terrestrial ecology of the region. Construction of the proposed bridge and laydown areas would be long-term in duration, but insignificant. Adoption of this alternative would require clearing of approximately 5 acres of forest. The plant communities found in the project area are common and well represented throughout the region. As of 2023, there were well over 138,000 acres of forest land in Carter County (USFS 2023). Cumulatively, project-related effects to forest resources would be negligible when compared to the total amount of forest land occurring in this County. Also, project-related work would temporarily affect some herbaceous plant communities, but these areas would likely recover to their pre-project condition in less than one year.

Nearly the entire project area currently has a substantial component of invasive terrestrial plants and adoption of the Action Alternative would not significantly affect the extent or abundance of these species at the county, regional, or state level. The use of TVA standard operating procedure of vegetating with noninvasive species (TVA 2022) would serve to minimize the potential introduction and spread of invasive species in the project area.

3.5 Aquatic Ecology

3.5.1. Affected Environment

The Project Area crosses Wilbur Reservoir on the Watauga River and is located within the Watauga River (0601010305) HUC-10 watershed, in the Southern Sedimentary Ridges level IV sub-ecoregion of the Blue Ridge Mountains Level III ecoregion (Griffith et al. 2009). Wilbur Reservoir comprises a two-mile stretch of the Watauga River from mile marker 34 to 36.5 between Wilbur and Watauga Dams. The Project Area is located between Watauga River miles 34.5 and 34.9 on Wilbur Reservoir. Surface waters in the vicinity of the Project Area are Wilbur Reservoir crossed by the existing and proposed new bridge and two other watercourses that TVA certified hydrologic professionals observed during a January 2023 field survey: one perennial stream near the bridge location and one ephemeral stream within laydown area #2.

Because construction and maintenance activities primarily affect riparian conditions and instream habitat, TVA evaluated the condition of these factors at each stream within the proposed project footprint. Hydrologic determinations were made using the Tennessee Division of Water Pollution Control (Version 1.5) field forms by Tennessee qualified hydrologic professionals-in training, which evaluate the geomorphology, hydrology, and biology of each stream (see Appendix D). A listing of two stream crossings in the Project Area is provided in Table 3-1. Additional information regarding watercourses in the vicinity of the Project Area can be found in Section 3.2, Wetlands.

Table 3-1. Stream Crossings within the Project Area

Stream ID	Stream Type	Field Notes	Longitude	Latitude
Asc001	Perennial	10x3. Multiple Tricoptera taxa present. Culverted under road.	-82.11784113	36.33715849
Asc002	Ephemeral	2x1 trickle of water in channel. Slight bed and bank that disappears in sections. Goes subterranean multiple times. Some sorting and alluvial material. No distinguishing bars or benches. No wrack limes. Leaves in channel. No biota. Small culvert at south.	-82.12003161	36.33642174

TVA assigns appropriate streamside management zones (SMZs) and BMPs based on these evaluations and other considerations (such as State 303(d) listing and presence of endangered or threatened aquatic species). Appropriate application of the BMPs minimizes the potential for impacts to water quality and instream habitat for aquatic organisms. TVA would adhere to state and federal permit requirements and commit to any mitigation provisions as a result of adverse modifications made to the Project Area.

3.5.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, TVA would not build a new bridge and the existing bridge would remain in place. Its structural issues and uncertainty in the bridge foundations would continue to prevent it from safely carrying all normal highway loads. No impacts would occur to aquatic ecology as a result of TVA actions.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Aquatic ecology could be affected by the Proposed Action Alternative. Impacts would either occur directly by the alteration of habitat conditions within Wilbur Reservoir or indirectly due to modification of the riparian zone and storm water runoff resulting from construction and demolition activities. Potential impacts due to construction related disturbance include increased erosion and siltation, loss of instream habitat, and alteration of the Watauga River banks and river bottom by heavy equipment. Siltation has a detrimental effect on many aquatic animals adapted to riverine environments. Turbidity caused by suspended sediment can negatively impact spawning and feeding success of fish species (Brim Box and Mossa 1999; Sutherland et al. 2002).

The streams documented within the proposed Project Area would be protected by SMZs and/or BMPs as defined in TVA (2022) or as required by standard permit conditions. These categories of protection are based on the variety of species and habitats that exist in the streams as well as the state and federal requirements to avoid harming certain species. As described in Section 3.1.2, to minimize potential impacts in Wilbur Reservoir, appropriate standard BMPs would be implemented during the Project. Therefore, potential impacts to aquatic life would likely be minor. No listed aquatic species or designated critical habitat is known from the potentially affected 10-digit HUC watersheds of the Project Area.

3.6 Threatened and Endangered Species

3.6.1. Affected Environment

3.6.1.1. Zoology

Review of the TVA Regional Natural Heritage Database and USFWS Information for Planning and Consultation Tool on December 23, 2022, resulted in records of two species of state conservation concern (common raven and Swainson's warbler) and one federally protected species (bald eagle) within 3 miles of the Project Area. Six additional federally listed (or proposed listed) species are known from Carter County, Tennessee: Carolina northern flying squirrel, gray bat, northern long-eared bat, tricolored bat, spruce-fir moss spider, and Virginia big-eared bat. The USFWS has determined that the federally listed Indiana bat and candidate species monarch butterfly could occur within the Project Area. Table 3-2 contains a species list of species of conservation concern (state-listed or state ranked S1-S3) within three miles of the Project Area, federally listed species within the Project Area County, and USFWS IPaC species results for the Project Area. Species-specific information and habitat suitability within the Project Area are discussed below.

Table 3-2. Federally listed terrestrial animal species reported from Carter County, Tennessee and other species of conservation concern documented within three miles of the Project Area

Common Name	Scientific Name	Status ¹	
		Federal	State ²
Birds			
Bald eagle	<i>Haliaeetus leucocephalus</i>	DL	D(S3)
Common raven	<i>Corvus corax</i>	-	-(S2)
Swainson’s warbler	<i>Limnothlypis swainsonii</i>	-	D(S3)
Invertebrates			
Monarch butterfly ^{4,5}	<i>Danaus plexippus</i>	C	-(S4)
Spruce-fir moss spider ⁶	<i>Microhexura montivaga</i>	E	-(S1)
Mammals			
Carolina northern flying squirrel ⁶	<i>Glaucomys sabrinus coloratus</i>	E	E(S1S2)
Gray bat ⁶	<i>Myotis grisescens</i>	E	E(S2)
Indiana bat ⁵	<i>Myotis sodalis</i>	E	E(S1)
Northern long-eared bat ⁶	<i>Myotis septentrionalis</i>	E	T(S1S2)
Tricolored bat ⁶	<i>Perimyotis subflavus</i>	PE	T(S2S3)
Virginia big-eared bat ⁶	<i>Corynorhinus townsendii virginianus</i>	E	E(S1)

Source: TVA Regional Natural Heritage Database, extracted 12/23/2022 and USFWS Information for Planning and Consultation (IPaC) resource list (<https://ecos.fws.gov/ipac/>), accessed 12/23/2022.

¹ Status Codes: C = Candidate species; D = Deemed in Need of Management; DL = Delisted; E = Endangered; Non-essential; PE = Proposed Endangered; PS = Partial Status; T = Threatened.

² State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure.

⁴Species that has not been documented within three miles of the project footprint or within Carter County, Tennessee; USFWS has determined this species could occur within the project area.

⁵Historically this species has not been tracked by state or federal heritage programs.

⁶Species known from Carter County, Tennessee but not from within three miles of the project footprint.

Bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). This species is associated with large mature trees capable of supporting their nests that can weigh several hundred pounds and are typically built near larger waterways where they forage primarily for fish (USFWS 2007a). Bald eagles are most reproductively successful in areas where human disturbance is minimized (Wilson et. al. 2018). Adults exhibit high pair and nest site fidelity throughout their lifetime (Jenkins and Jackman 1993). A bald eagle nest record is known approximately 0.5 miles from the Project Area No bald eagles or nests were observed during field reviews of the APE in February 2023. Foraging habitat is not over the Wilbur Reservoir.

Common ravens are associated with remote mountain forests and rocky cliffs and breeding populations in Tennessee are restricted to the mountains of eastern Tennessee. The breeding season typically begins in January or February, when adults will begin to build will build stick nests on cliffsides or in trees, lay eggs, and raise young through May/June (Boarman & Heinrich 2020). Ravens may build their nests in a variety of habitats. The nearest common raven record is approximately 0.6 miles away from the Project Area, where a nest was observed in 1999 on a rock wall. Suitable nesting habitat is present within the Project Area.

Swainson's warblers are typically associated with large areas of forested mature bottomland hardwood forests that have dense canopy cover but have also been observed breeding in forested mountain ravine habitat with dense understory. A historical record of a Swainson's warbler exists 0.1 miles. Suitable habitat is present adjacent to the Project Area.

The monarch butterfly is a highly migratory species, with eastern United States (U.S.) populations overwintering in Mexico. Monarch populations typically return to the eastern U.S. in April (Davis and Howard 2005). Summer breeding habitat requires milkweed plant species, on which adults exclusively lay eggs for larvae to develop and feed on. Adults will drink nectar from other blooming wildflowers when milkweeds are not in bloom (NatureServe 2022). Though some flowering plants may be present throughout the Project Area, significant breeding or foraging habitat is not present within the Project Area. Though this species has not been historically tracked by state or federal heritage programs, the USFWS IPaC tool determined that this species could occur within the Project Area. Monarchs were not observed during the field survey of the Project Area in February 2023; however, it is expected that most individuals would be closer to their overwintering grounds at that time.

Spruce-fir moss spiders are small spiders highly associated with damp moss mats in spruce-fir forests above 1600 meters (approx. 5400 feet) and are found only in the high Appalachian Mountains in Tennessee, North Carolina, and Virginia. The nearest record of a spruce-fir moss spider is approximately 15.6 miles from the Project Area. The Project Area is at approximately 500m elevation and suitable habitat does not exist in the Project Area.

Carolina northern flying squirrels are nocturnal arboreal species, typically found at high elevation (> 1200 m or 4000 feet) coniferous forests in the southern Appalachians (Payne et al 1989). Flying squirrels will den in tree cavities in live and dead trees or in stick nests in foliage (Weigl et al. 1999). The nearest record of a Carolina northern flying squirrel is approximately 24.8 miles from the Project Area in the Cherokee National Forest. The Project Area is at approximately 500 meters (~1650 feet) above sea level. Habitat for northern flying squirrel is not present within the Project Area.

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall (Brady et al. 1982, Tuttle 1976a, b). Bats disperse over bodies of water at dusk where they forage for insects emerging from the surface of the water (Harvey 2011). There are no known gray bat records from Carter County, Tennessee, but the USFWS has determined that this species could be expected to occur within the Project Area. No additional caves were observed during the field survey in February 2023.

Indiana bats hibernate in caves in winter and use areas around them in fall and spring (for swarming and staging), prior to migration back to summer habitat. During the summer, Indiana bats roost under the exfoliating bark of dead and living trees in mature forests with an open understory, often near sources of water. Indiana bats are known to change roost trees frequently throughout the season, yet still maintain site fidelity, returning to the same summer roosting areas in subsequent years. This species forages over forest canopies, along forest edges and tree lines, and occasionally over bodies of water (Kurta et al. 2002,

USFWS 2007b, USFWS 2022). There are no known Indiana bat records from Carter County, Tennessee, but the USFWS has determined that this species could be expected to occur within the Project Area.

The northern long-eared bat predominantly overwinters in large hibernacula such as caves, abandoned mines, and cave-like structures. During the fall and spring, they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees. Roost selection by northern long-eared bat is similar to that of Indiana bat, however northern long-eared bats are thought to be more opportunistic in roost site selection. This species also roosts in abandoned buildings and under bridges. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas (USFWS 2014). Northern long-eared bat records are known from Carter County, Tennessee. The nearest record is approximately 7.5 miles away from the Project Area and is a summer mist-net capture record.

Tricolored bats hibernate in caves or man-made structures such as culverts or bridges (Fujita and Kunz 1984, Newman et al 2021). During the summer, tricolored bats roosting in clumps of tree foliage, often in oak and hickory trees (Veilleux et al. 2003, O'Keefe et al. 2009, Schaefer 2017, Thames 2020). Foraging studies of tricolored bats are lacking, but it is believed they typically forage near their roost trees in forested areas and riparian corridors. Tricolored bats are known from Carter County, Tennessee. The nearest known record is approximately 9.8 miles away from the project area where tricolored bats were observed in a cave.

Virginia big-eared bats (VBBE) are known from the Appalachian region of Kentucky, Virginia, West Virginia, North Carolina, and Tennessee. In the winter VBBEs use caves as hibernacula. Female VBBEs will use warm parts of the caves during the summer, forming maternity colonies. Males are believed to be solitary, but it is unknown where they spend the summer (Harvey 1992).

Two caves are known within three miles of the Project Area, and no caves were observed in the project footprint during field reviews in February 2023. Roosting habitat for gray bats and VBBEs is not present within the Project Area.

The area where tree removal is proposed (laydown area #2) was assessed for potential summer roosting and foraging habitat for the Indiana bat, northern long-eared bat, and tricolored bat following the 2023 Range Wide Indiana Bat and Northern Long-eared Bat Survey Guidelines (USFWS 2023). Approximately 6 trees within the approximate 2 acres of tree removal offered suitable summer roosting habitat for Indiana bats and northern long-eared bats (deciduous trees with flakey bark or crevices). Suitable roosting habitat for tricolored bat was not present, as the area is largely pine forest.

Foraging habitat for, tricolored, Indiana, and northern long-eared bat exists along the wooded edges within the Project Area. Aquatic foraging habitat for all bat species is present within the Project Area over Wilbur Reservoir.

The bridge proposed for demolition was surveyed for evidence of bat use during a field survey in February 2023. The existing bridge does not offer suitable roosting habitat for any bat species as there are no crevices for bats to use.

3.6.1.2. Botany

Review of the TVA Natural Heritage Database indicates that twenty-seven state and no federally listed plant species have been previously reported within a five-mile vicinity of the Project Area (Table 3-3). Four federally listed plant species have been previously reported from Carter County, Tennessee. TVA observed three rough avens plants, which is a species considered to be of special concern by the State of Tennessee, at the bridge site on a small rocky bluff on the northwestern side of the bridge. No federally listed plants were observed in the Project Area. No designated critical habitat for plants occurs in the Project Area.

Table 3-3. Plant species of conservation concern previously reported from within five miles of the Project Area and Federally Listed Plant Species in Carter County, Tennessee

Common Name	Scientific Name	Federal Status ¹	TN State Status ¹	State Rank ²
PLANTS				
Climbing Fumitory	<i>Adlumia fungosa</i>	–	THR	S2
Piratebush	<i>Buckleya distichophylla</i>	–	THR	S2
Marsh-marigold	<i>Caltha palustris</i>	–	END	S1
Marsh Bellflower	<i>Campanula aparinoides</i>	–	SPCO	S2
Roundleaf Water-cress	<i>Cardamine rotundifolia</i>	–	SPCO	S2S3
Sedge	<i>Carex hitchcockiana</i>	–	THR	S1
Sedge	<i>Carex roanensis</i>	–	SPCO	S2
Spotted Coral-root	<i>Corallorhiza maculata</i>	–	THR	S1
Pale Corydalis	<i>Corydalis sempervirens</i>	–	SPCO	S1S2
Fraser’s Sedge	<i>Cymophyllus fraserianus</i>	–	SPCO	S3
Water-purslane	<i>Didiplis diandra</i>	–	THR	S1
Willow-herb	<i>Epilobium ciliatum</i>	–	THR	S1
Rough Bedstraw	<i>Galium asprellum</i>	–	SPCO	S1
Rough Avens	<i>Geum laciniatum</i>	–	SPCO	S1
Spreading Avens ⁴	<i>Geum radiatum</i>	END	END	S1
Dwarf Rattlesnake-plantain	<i>Goodyera repens</i>	–	SPCO	S1
Rock Gnome Lichen ⁴	<i>Gymnoderma lineare</i>	END	END	S1
Mountain Bluet ⁴	<i>Hedyotis purpurea var. montana</i>	END	END	S1
White-leaved Sunflower	<i>Helianthus glaucophyllus</i>	–	THR	S2
Virginia Waterleaf	<i>Hydrophyllum virginianum</i>	–	THR	S3
Pale St. John’s-wort	<i>Hypericum ellipticum</i>	–	END	S1
Meehania mint	<i>Meehania cordata</i>	–	THR	S2
Broadleaf Bunchflower	<i>Melanthium latifolium</i>	–	END	S1S2
Godfrey’s Stitchwort	<i>Minuartia godfreyi</i>	–	END	S1
American ginseng	<i>Panax quinquefolius</i>	–	S-CE	S3S4
Creekgrass	<i>Potamogeton epihydrus</i>	–	SPCO	S1S2
Blue Ridge Goldenrod ⁴	<i>Solidago spithamaea</i>	THR	END	S1
Branching Burreed	<i>Sparganium androcladum</i>	–	END	S1
Skunk Cabbage	<i>Symplocarpus foetidus</i>	–	END	S1
Carolina Hemlock	<i>Tsuga caroliniana</i>	–	THR	S3
Appalachian Cliff-fern	<i>Woodsia scopulina ssp. appalachiana</i>	–	SPCO	S1S2

Source: TVA Natural Heritage Database, queried February 2023

¹ Status Codes: END = Listed as Endangered; SPCO = Listed as Special Concern in Tennessee; S-CE = Special Concern/Commercially Exploited; THR = Listed as Threatened

² State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; S#S# = Denotes a range of ranks because the exact rarity of the element is uncertain (e.g., S1S2)

3.6.1.3. Aquatic Species

A query of the TVA Natural Heritage Database and the U.S. Fish and Wildlife Service’s Information for Planning and Consultation (IPaC) indicated no federally listed aquatic species as occurring within the potentially affected Watauga River 10-digit HUC watershed of the Project Area (Table 3-4). The fish community in Wilbur Reservoir is composed mostly of cold-water pelagic game and forage fish.

One record of the Tennessee state-listed Tangerine darter (*Percina aurantiaca*) is known from the tailwater downstream of Wilbur Dam. However, this record is historic. Due to the impounding of their habitat by Wilbur and Watauga Dams, the Tangerine darter has not been reported from near Wilbur Dam in over 100 years. No other state-listed aquatic species are known from Wilbur Reservoir.

Table 3-4. Records of federal and state-listed aquatic animal species within Watauga River (0601010305) 10-digit HUC watersheds

Scientific Name	Common Name	¹ State Rank	² State Status	³ Element Rank	⁴ Federal Status
Fishes					
<i>Percina aurantiaca</i>	Tangerine Darter	S3	D	H	

Source: TVA Natural Heritage and USWFS IPAC Databases, queried by Cory Chapman on 2/20/2023

¹ State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable

² State Status Codes: D = Deemed in need of conservation; E = Endangered; T = Threatened

³ Element Rank (=population) Rank; E = Extant record ≤25 years old; H = Historical record >25 years old; ? = Uncertain status; X – Extirpated; AC - Excellent, good, or fair estimated viability; D - Poor estimated viability

⁴ Federal Status Code: LT = Listed Threatened; LE = Listed Endangered

3.6.2. Environmental Effects

3.6.2.1. Zoology

The No Action Alternative

Under the No Action Alternative, TVA would not build a new bridge and the existing bridge would remain in place. Terrestrial wildlife and their habitats would not be impacted.

The Proposed Action Alternative - Wilbur Reservoir Bridge Replacement

Due to the distance from known records to the Project Area (approximately 0.5 miles), no bald eagle nests would be impacted by the proposed Project actions. Project actions would comply with the National Bald Eagle Management Guidelines. Bald eagles would not be impacted by the Project.

Suitable breeding habitat is present within the Project Area for common ravens. Tree removal would be needed under Alternative B. Suitable potential nesting habitat is abundant in the immediate areas. If an active nest is present, nest disturbance should be avoided to reduce impacts to breeding individuals. The Project would not impact populations of common ravens.

Suitable breeding habitat for Swainson's warbler is not present within the Project Area. Swainson's warbler would not be impacted by the Project.

Carolina northern flying squirrel habitat is not present within the Project Area and would not be impacted by the Project.

Five federally listed or protected bat species were addressed based on the potential for the species to occur within the Project Area. Gray bat, Virginia big-eared bat, and Indiana bat, northern long-eared bat, and the tricolored bat have the potential to occur within the Project Area, utilizing Wilbur Reservoir as foraging habitat. Due to the lack of caves and suitability of the existing bridge as roosting habitat, it is unlikely that gray bats or Virginia big-eared bats would utilize the Project Area for roosting. The Project Area is largely pine trees and is not considered suitable roosting habitat for tricolored bat. Indiana bat and northern long-eared bat may use some trees within the Project Area for summer roosting.

No caves or other hibernacula for Indiana bat, northern long-eared bat, or tricolored bat are known within the Project Area or within three miles of the Project Area. Approximately 6 trees within the Project Area offer suitable summer roosting habitat for Indiana bat and northern long-eared bat. The proposed project actions would avoid removing the trees identified as suitable summer roosting habitat. The trees that would be removed are pine trees and other deciduous trees that do not offer suitable roosting habitat. Aquatic foraging habitat is present within the Project Area, and Best Management Practices should be implemented to preserve water quality. Avoidance of suitable habitat would avoid direct impacts to northern long-eared bat and Indiana bat.

A number of activities associated with the Project, including tree removal, were addressed in TVA's programmatic consultation with the U.S. Fish and Wildlife Service on routine actions and federally listed bats in accordance with ESA Section 7(a)(2), completed in April 2018 and updated in May 2023. For those activities with potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on page 5 of the TVA Bat Strategy Project Screening Form and need to be reviewed/implemented as part of the Project. Considering the scope of the Project, distance to known bat records, and implementation of conservation measures, including avoiding suitable summer roosting habitat, significant impacts to Virginia big-eared bat, gray bat, Indiana bat, and northern long-eared bat are not anticipated as a result of the Project. The Project would not jeopardize the continued existence of the tricolored bat.

3.6.2.2. Botany

The No Action Alternative

Adoption of the No Action Alternative would not impact federally listed plants, designated critical habitat, or state-listed plants species because the Project would not occur. The three rough avens plants would not have to be dug up and replanted at another location along Wilbur Reservoir. No federally listed plants or designated critical habitat occurs within the Project Area. Changes to local plant communities resulting from natural ecological processes and human-related disturbance would continue to occur. These

changes may benefit or negatively affect plants present in the project area, but the changes would be unrelated to the proposed Project.

The Proposed Action Alternative - Wilbur Reservoir Bridge Replacement

Adoption of the Proposed Action Alternative would not affect federally listed plant species or designated critical habitat because neither occurs in the project area, but implementation of this alternative would impact state-listed plants. Three plants of the state special concern, rough avens are situated along a small bluff adjacent the northwestern edge of the old bridge and would be heavily impacted during bridge construction. Because of its location, avoiding impacts to the species during construction would be difficult. Adjusting the alignment of the proposed bridge to avoid the rough avens is not feasible in this area because the location of the new bridge can't be moved.

Due to the rarity of rough avens in Tennessee (species is S1 in Tennessee), there is the potential for significant impacts to the species resulting from construction and operation of the new bridge. To remove the potential for significant impacts, TVA would implement mitigation measures that would ensure that construction and maintenance of the new bridge would not eliminate the species from the site.

To mitigate adverse impacts to three rough avens plants, prior to ground disturbing activities, TVA botanists would dig up the three plants in the project footprint in the fall season and relocate the plants to an appropriate habitat near the Project Area along the Wilbur Reservoir. Therefore, impacts to the rough avens plants would be minor.

3.6.2.3. Aquatic Species

The No Action Alternative

Under the No Action Alternative, TVA would not build a new bridge and the existing bridge would remain in place. No impacts would occur to aquatic threatened and endangered species as a result of TVA actions.

The Proposed Action Alternative - Wilbur Reservoir Bridge Replacement

As noted above in Section 3.6.1.3, Tangerine darters are considered historic in the Project Area watershed, due to the impounding of their habitat by Wilbur and Watauga Dams. This Tennessee state-listed species has not been reported from near Wilbur Dam in over 100 years. No other state-listed aquatic species are known from Wilbur Reservoir. No federally listed aquatic species occur within the potentially affected Watauga River 10-digit HUC watershed of the Project Area. Therefore, impacts to threatened and endangered species are not anticipated to occur as a result of the proposed bridge replacement project.

3.7 Cultural Resources

3.7.1. Affected Environment

3.7.1.1. Regulatory Framework for Cultural Resources

Cultural resources include archaeological sites, districts, buildings, structures, and objects, as well as locations of important historic events. Federal agencies, including TVA, are required by the National Historic Preservation Act (NHPA) (16 USC 470) and by NEPA to

take concerns about historic properties into consideration while planning undertakings. *Undertaking* means any project, activity, or program, and any of its elements, which has the potential to affect a historic property and is under the direct or indirect jurisdiction of a federal agency or is licensed or assisted by a federal agency. An agency may fulfill its statutory obligations under NEPA by following the process outlined in the regulations implementing Section 106 of NHPA at 36 CFR Part 800.

Section 106 of the NHPA requires that federal agencies consider the potential effects of their actions on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the action. Section 106 requires identifying historic properties in the area of potential effects (APE), assessing adverse effects, resolving adverse effects on historic properties. This process is carried out in consultation with the State Historic Preservation Officer (SHPO) in the state where the project is located and other interested consulting parties, including federally recognized Indian tribes (Tribes).

Cultural resources are considered historic properties if they are listed or eligible for listing in the National Register of Historic Places (NRHP). The NRHP eligibility of a resource is based on the Secretary of the Interior's criteria for evaluation (36 CFR 60.4), which state that significant cultural resources possess integrity of location, design, setting, materials, workmanship, feeling, association, and

- a. Are associated with events that have made a significant contribution to the broad patterns of our history; or
- b. Are associated with the lives of persons significant in our past; or
- c. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or
- d. Have yielded, or may yield, information (data) important in prehistory or history.

If the agency determines (in consultation) that the undertaking's effect on a historic property would diminish any of the qualities that make it eligible for the NRHP (based on the criteria for evaluation at 36 CFR Part 60.4, above), the effect is said to be adverse. Examples of adverse effects would be ground disturbing activity in an archaeological site or erecting structures within the viewshed of a historic building in such a way as to diminish the structure's integrity of feeling or setting. Resolution of adverse effects may consist of avoidance (such as choosing a project alternative that does not result in adverse effects), minimization (such as redesign to lessen the effects), or mitigation. Agencies are required to consult with SHPOs, Tribes, and others throughout the Section 106 process and to document adverse effects to historic properties resulting from agency undertakings.

3.7.1.2. *Area of Potential Effects (APE)*

As defined in the ACHP's regulations implementing Section 106 at 36 CFR Part 800.16, a federal undertaking's APE is the geographic area or areas within which the undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties are present.

For The No Action Alternative, TVA would not propose any actions with potential to affect historic properties, and TVA would not be required to follow the Section 106 process. Therefore, there would be no APE.

For the Proposed Action Alternative, Wilbur Reservoir Bridge Replacement, the APE consists of all areas where ground disturbance would occur as a result of the project and areas within one-half mile from which the new bridge would be visible. Ground disturbance areas include the location of the new bridge, linear areas that would be affected by changes in the road alignment, the concrete retaining wall footprint, and three temporary construction laydown areas. The APE also includes the existing bridge, as it is a potentially historic resource that would be removed. TVA has determined the viewshed of the proposed bridge based on a GIS model that takes topography, vegetation, and the built environment within a one-half mile radius of the new bridge into consideration. Many areas within the half-mile radius would have no clear views of the bridge; areas that would have clear views are within the APE.

No archaeological surveys had been carried out in the Project Area previously, and there are no previously recorded sites in the footprint. The project footprint overlaps the boundaries of two properties listed in the NRHP: the Wilbur Hydroelectric Project and the Watauga Hydroelectric Project. The archaeological survey conducted for this project in early 2023 identified three archaeological sites, designated 40CR264, 40CR265, and 40CR266. All three sites consist of small, low-density scatters of historic artifacts associated with the past locations of historic structures that were constructed for the Watauga Hydroelectric Project and demolished after construction, probably in 1949. All three are in locations disturbed by road construction or erosion. TVA finds that sites 40CR264 and 40CR265 are ineligible for the NRHP.

Site 40CR266 is associated with a dormitory that was used to house African American workers during construction of Watauga Dam. This site contains a stone feature consisting of a pile of limestone blocks. CRA's research indicates this feature is historic and was created during the Watauga Dam construction project. Although most of 40CR266 lacks data important in history or prehistory due to a paucity of artifacts and lack of intact deposits, an upper terrace extending west from the investigated site has potential for deposits that could provide data important to an understanding of the workers' camp. Most of the area with such potential lies outside the Project Area, but a small section of it is within the western extremity of the southern proposed laydown area (laydown #3).

The Wilbur Hydroelectric Project and the Watauga Hydroelectric Project are both listed in the NRHP. The Project Area partially overlaps the NRHP boundary of the Wilbur Hydroelectric Project, and the Project's viewshed overlaps the boundaries of both. TVA has determined that the existing Wilbur Reservoir Bridge lacks historic, engineering, and architectural significance and does not meet criteria for listing in the NRHP either as an individual resource or as a contributing resource to either of the listed properties.

Based on this survey, TVA has determined that 40CR264 and 40CR265 are ineligible for the NRHP and 40CR266 should be considered potentially eligible due to the potential presence of intact archaeological deposits relating to the Watauga Dam Construction Camp. The data collected by the survey on 40CR266 are insufficient to allow a final

determination of eligibility. TVA consulted with the SHPO and Tribes regarding the study findings and TVA's eligibility determinations, pursuant to 30 CFR 800.5(c). The SHPO responded on May 25, 2023, with concurrence with TVA's eligibility determination and findings. None of the consulted tribes provided a formal response by the end of the consultation period.

3.7.2. Environmental Effects

The No Action Alternative

As this alternative involves no physical activities, no effects on historic properties would result from the No Action Alternative.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

TVA proposes to avoid adverse effects on potentially eligible site 40CR266. Project activity within the site boundary would consist of the temporary storage of vehicles and materials during construction. TVA would avoid adverse effects to this site (laydown area #3) by flagging the western portion of the site with high-visibility flagging tape during construction, recording this as a “sensitive area” on design drawings, and requiring the construction crew to exclude the sensitive area from use. These measures would ensure no vegetation clearing, vehicle use, or ground disturbing activities occur in the sensitive area. TVA finds that with these measures in place the undertaking will avoid adverse effects on potentially eligible site 40CR266.

The historic architectural survey noted that the proposed bridge would not be visible from Wilbur Dam or Watauga Dam, nor from any of the contributing resources of either property. Three structures that are part of the Wilbur Hydroelectric plant are within the viewshed of the proposed bridge. However, these structures are all younger than the period of significance for the NRHP-listed property and lack historic, architectural, and engineering significance. The existing Wilbur Reservoir Bridge also lacks historic significance.

TVA's consultation with SHPO and Tribes pursuant to 36 CFR Part 800 included the proposed avoidance measures. SHPO agreed that the implementation of these measures should avoid any adverse effects on site 40CF266 and none of the tribes objected. Therefore, TVA has fulfilled its responsibilities under Section 106 of the NHPA.

3.8 Managed and Natural Areas

3.8.1. Affected Environment

Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, U.S. Department of Agriculture, U.S. Forest Service, State of Tennessee) to protect and maintain certain ecological and/or recreational features. Natural areas include ecologically significant sites; federal, state, or local park lands; national or state forests; wilderness areas; scenic areas; wildlife management areas; recreational areas; greenways; trails; Nationwide Rivers Inventory streams; and wild and scenic rivers. Ecologically significant sites are either tracts of privately owned land that are recognized by resource biologists as having significant environmental resources or identified tracts on TVA lands

that are ecologically significant but not specifically managed by TVA's Natural Areas program.

A review of the TVA Regional Natural Heritage database identified 14 managed and natural areas within three miles of the Project Area (Table 3-5).

Table 3-5. Managed/Natural Areas that occur within 3 miles of the Project Area

Natural Area	Acres	County	State	Distance/Direction from project area
Wilbur Dam Reservation	2.24	Carter	TN	0.5 mi west
Watauga Scenic Area	1104.99	Carter	TN	1.9 mi south
Wilbur Lake State Wildlife Observation Area	107	Carter	TN	overlap
Cherokee National Forest	656051.3	Multiple	Multiple	adjacent
Big Laurel Branch Wilderness Study Area	6365.1	Multiple	TN	adjacent
Watauga Reservoir Reservation	7003.17	Multiple	TN	0.6 mi south
Watauga Dam Reservation	6110.81	Multiple	TN	0.6 mi south
Pond Mountain Wilderness	6939.95	Carter	TN	1.9 mi south
Wilbur Reservoir Reservation	71.42	Carter	TN	overlap
North Cherokee National Forest (NF) and Wildlife Management Area	334706.5	Multiple	Multiple	adjacent
Iron Mountain South	1478.09	Carter	TN	0.3 mi east
Wilbur Cliffs	369.37	Carter	TN	overlap
Griffith Branch Cove	144.04	Carter	TN	1.2 mi south

There are 7 natural or managed areas that overlap with or are immediately adjacent to the Project Area (i.e., within 0.5 miles). Wilbur Lake State Wildlife Observation Area, managed by TVA and TWRA, includes Wilbur Lake which is surrounded by forests and provides habitat for waterfowl and shorebirds. Cherokee National Forest and North Cherokee NF and Wildlife Management Area are managed for multiple purposes by the USFS and TWRA. Big Laurel Branch Wilderness Study Area is managed by the USFS. Wilbur Dam Reservation and Wilbur Reservoir Reservation are TVA Assets and Wilbur Cliffs is a conservation site within the boundaries of the Cherokee National Forest. The Iron Mountain South is located 0.3 miles east from the project area. This conservation site has habitat potential for rare plant communities.

Natural and managed areas within 0.5 miles of the Project Area are shown in Figure 5 below.

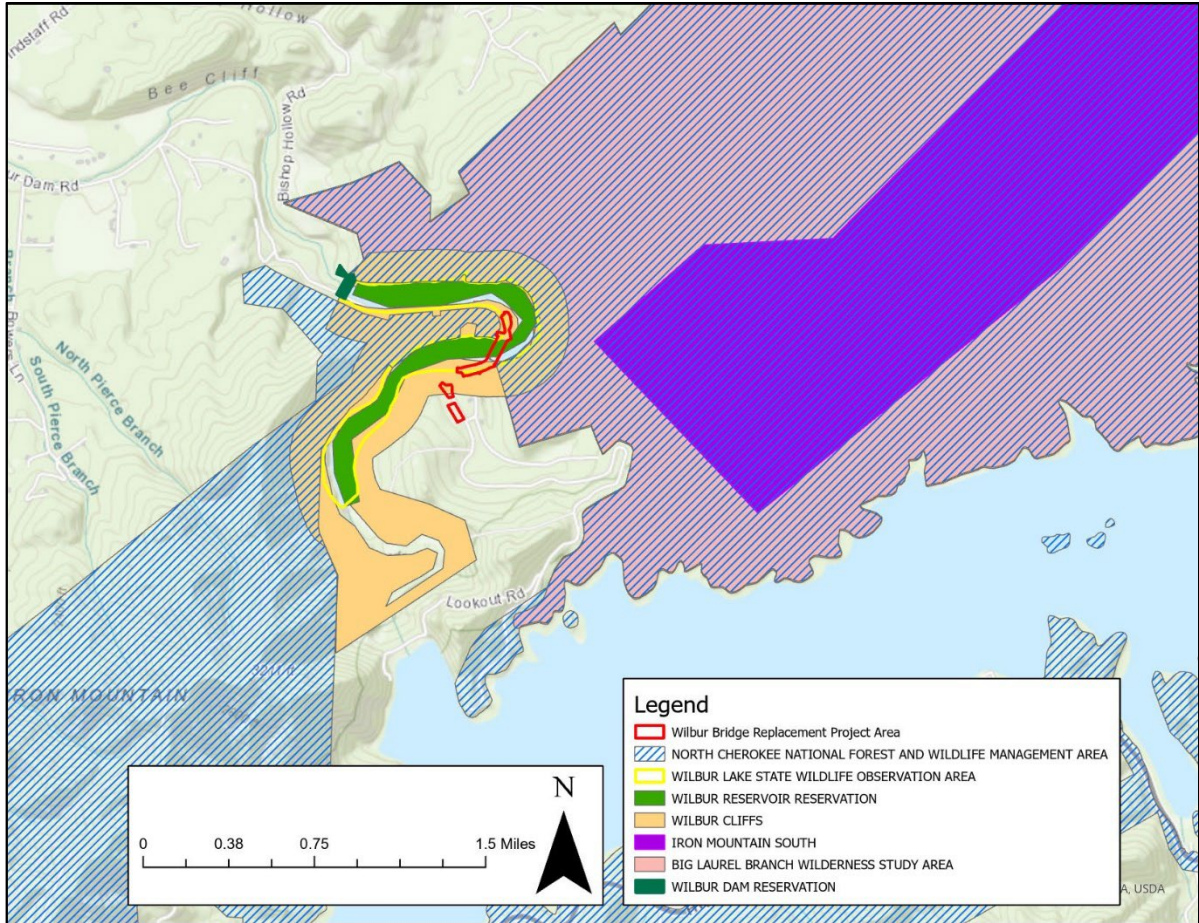


Figure 5. Natural and Managed Areas within 0.5 miles of Project Area

3.8.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, the proposed project would not be implemented and no impacts to natural areas would be anticipated. Therefore, there would be no direct or indirect impacts to managed or natural areas.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Under the Proposed Action Alternative, TVA would replace the existing bridge, Wilbur Reservoir Bridge, with a new concrete bridge aligned on the eastern side, or just downstream, of the existing bridge. The following natural areas overlap or are adjacent (within 0.5 miles) of the Project Area: Wilbur Lake State Wildlife Observation Area, Cherokee National Forest and North Cherokee NF and Wildlife Management Area, Big Laurel Branch Wilderness Study Area, Wilbur Dam Reservation, Wilbur Reservoir Reservation, Iron Mountain South, and Wilbur Cliffs.

There would be direct impacts due to ground disturbing activities in natural areas that overlap the Project Area. Indirect impacts could occur on areas that are within 0.5 miles of

the Project Area. These indirect impacts would include construction noise, visual intrusions, and stormwater runoff, which would be minimized with standard BMPs and coordination with land managers of nearby managed/natural areas.

Under this alternative, construction materials and demolition/bridge debris would be transported by truck. The haul route would include Wilbur Dam Road. Therefore, there is potential for indirect impacts to those managed/natural areas that are within the vicinity of the Project Area associated with increased traffic, noise, and potential fugitive dust from the transport vehicles during both the new bridge and demolition phases of construction.

Impacts to these environmental resources are covered in other subsections of this EA. None of the managed/natural areas would be closed during the Project. Due to the temporary nature of the Project and implementation of BMPs and mitigation measures, impacts to managed/natural areas would be short-term and minor.

The proposed project area overlaps with a TVA Zone 4 parcel (indicating a land use of Natural Resource Conservation), for which U.S. Forest Service has an easement. TVA would continue to coordinate with the Forest Service about the Project.

3.9 Recreation

3.9.1. Affected Environment

This Project takes place on a portion of Wilbur Lake and Wilbur Dam Reservation Area, which are used by the public for recreational boating, camping, fishing, and other recreational activities. Recreation assets that are water-based and land-based will be considered during this review. Below are the water-based recreational sites within one river mile of the Project Area on Wilbur Dam Reservation area (Figure 6):

- Watauga Dam Campground (.54 river miles upstream of Project Area on River Road)
- TVA Boat Ramp and parking area (adjacent to the Project Area; on River Road across from laydown area #2)
- TVA Wilbur Reservoir Overlook Area (within the Project Area, just north of the bridge, and would serve as laydown area # 1)
- TVA Boat Ramp (1 river mile downstream of Project Area)

Below are recreation areas not on Wilbur Dam Reservation area, but are within a 3-mile radius of the Project Area:

- Appalachian Trail (1.13 miles south)
- Appalachian Trail Lakeside Camp (1.07 miles south)
- Watauga Point Trailhead (2.14 miles south)
- Watauga Dam Boat Ramp and Parking (1.74 miles south)

Watauga Dam Campground is a TVA-owned campground on Wilbur Lake, with 29 RV sites requiring a reservation. The campground also includes a large picnic area for campground users. Downstream from the campground is a TVA boat ramp with a large parking lot open

to the public for recreation and fishing boats. Downstream from the boat ramp and within the project area is the TVA Wilbur Reservoir Overlook Area. The Overlook Area includes picnic tables and a parking lot that is accessible to the public and would become laydown area # for the duration of the Project. Further downstream, and outside of the Project Area, is another TVA boat ramp and parking lot that is used by recreational and fisherman boats.

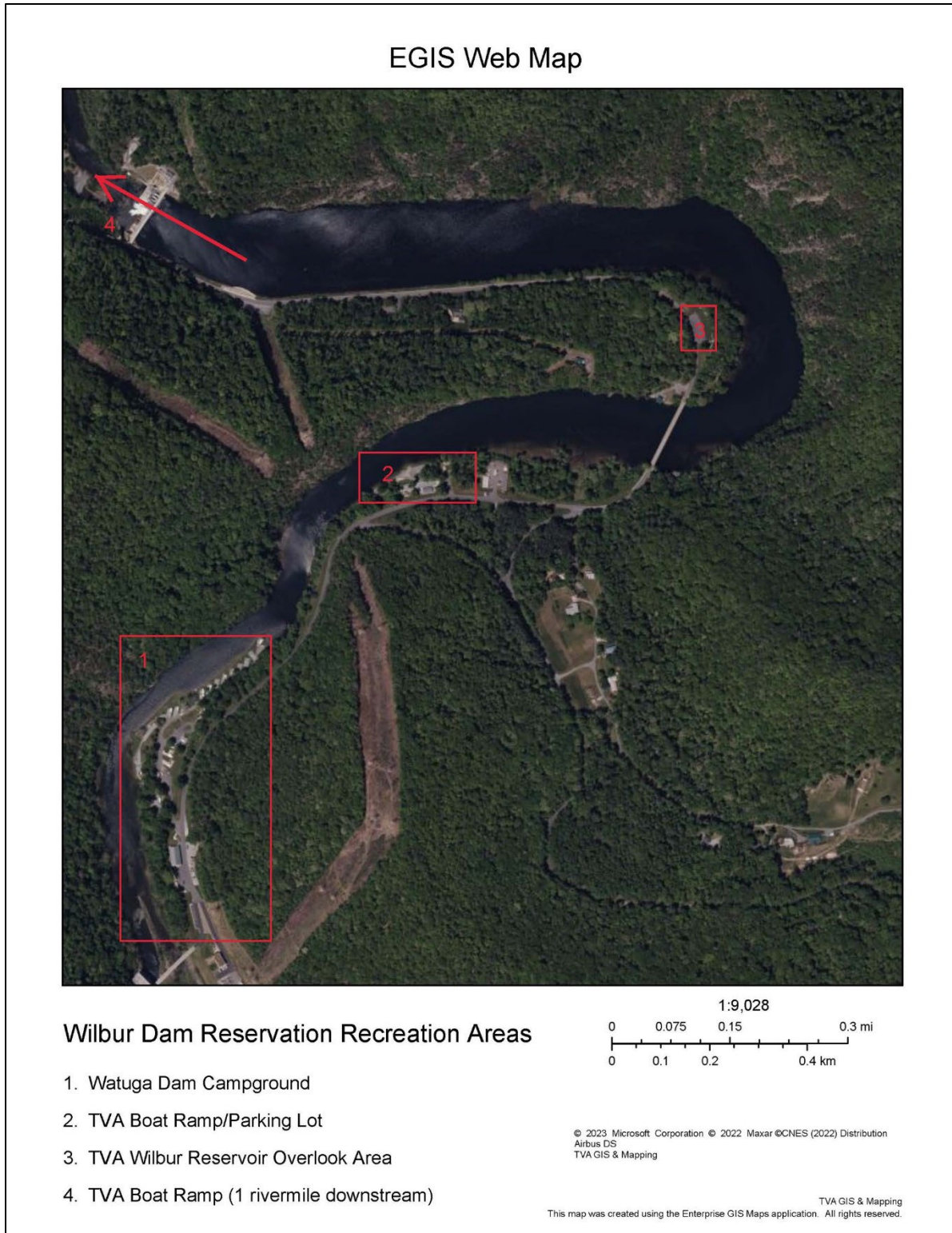


Figure 6. Wilbur Dam Reservation Recreation Areas

3.9.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, the proposed Project would not be implemented and no impacts to natural areas would be anticipated. Therefore, there would be no direct or indirect impacts to Recreation. Because the existing bridge is “load posted,” over a period of time, if its structural issues are not addressed, access to these recreation sites could be jeopardized. As noted above, a “load posted” bridge means it cannot safely carry normal highway loads and has structural issues that require it to be inspected annually.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Under the Proposed Action Alternative, although direct impacts would occur to the water-based recreational areas on Wilbur Dam Reservation Area, the impacts would be minor and temporary.

The bridge crossing is the only access to the TVA boat ramp adjacent to the Project Area (#2, Figure 6) and the Watauga Dam Campground (#1, Figure 6). During construction, traffic on Wilbur Dam Road would remain open, although it is anticipated that total closures would be short term (less than an hour), with accommodations for emergency vehicles. Single-lane closures are also likely and could last for a longer period (several days or more). While traffic and transportation have the potential to be occasionally disrupted and inconvenient for recreational users, users will still be able to access these areas.

During construction, the TVA Wilbur Reservoir Overlook Area (including parking lot and picnic area) would be temporarily closed to the public and would not be accessible during the full Project timespan. The parking lot/picnic area portion of the Overlook Area would become laydown area #1. This area would serve as laydown area until the approaches for the realigned roadway, in association with new bridge construction, are built. The approaches of the road would take a large portion of the current picnic area. The temporary closure of the Overlook Area would impact recreational users. To mitigate this temporary impact, TVA would relocate the picnic tables to a parking lot on Wilbur Dam Road just upstream from Wilbur Dam. After construction and demolition activities are completed, the laydown area would be restored by reseeding to establish permanent vegetative cover. The picnic tables would be returned, and the Overlook Area would be reopened. The placement of approaches for the realigned roadway would result in the permanent impact of a reduction in size of the Overlook Area.

Watauga Dam Campground could possibly experience an indirect effect of intermittent noise during the new bridge construction and demolition of the existing bridge (see Section 3.11, Noise). Noise associated with blasting the concrete piers of the existing bridge during demolition would be greatest (if explosives are used), although it would occur in a short period of time and residents, including Watauga Dam Campground, would be alerted to demolition plans prior to those activities. The elevations in noise levels beyond the ambient noise levels in the Project Area would be intermittent and temporary and cease when construction and demolition is complete. Elevated noise would only occur during the daytime hours.

TVA would frequently coordinate with Watauga Dam Campground to ensure potential impacts are minimized during the Project. Temporary impacts would affect boaters utilizing Wilbur Lake for fishing and recreational usage. Limited times of lowered water elevation would be needed during new bridge construction for the drilled shafts and/or during demolition/removal of the existing bridge. During these activities, TVA would draw down Wilbur Reservoir below its normal operating range of 1644 to 1648 feet to a reservoir elevation in the mid-1620s for a brief period of approximately six hours. However, for most of the time, TVA would maintain the reservoir water level within Wilbur's normal operating range. Demolition activities could cause some temporary shifts in recreational boating and fishing in the waters immediately adjacent to the bridge, but any impacts would be minor due to the short duration of demolition.

The Project would temporarily impact the typical scenery experienced on Wilbur Lake. Construction activities and ground disturbance visible from boaters on the reservoir would adversely alter the natural setting, as well as produce noise impacts when passing through the area of the new bridge construction (see Section 3.11, Noise).

Regarding recreation areas not on Wilbur Dam Reservation area, construction of the new bridge would not result in direct or indirect impacts to these recreational areas.

Overall, impacts to recreation areas on Wilbur Dam Reservation Area due to the construction of the Wilbur Reservoir Bridge will be insignificant and temporary. Due to the nature of the project, no significant long-term impacts to these recreational areas are expected. Additionally, construction of the new bridge would have positive impacts to recreation when the Project is complete. The new bridge would allow safer and long-term access to the public and recreation visitors to the area's recreation sites.

3.10 Transportation

3.10.1. Affected Environment

Wilbur Dam Road is a rural collector roadway that provides the sole access to TVA's Wilbur Dam, Watauga Dam, Watauga Dam Campground, and a small community of residences. The road terminates at Watauga Dam's visitor center 2.5 miles south of the Project Area. According to Tennessee Department of Transportation (TDOT), traffic data taken on the roadway near Wilbur Reservoir Bridge had an annual average daily traffic calculation of 449 vehicles in 2022. In the five-year period from 2017 through 2022, there was an annual average daily traffic calculation of 531 vehicles. Sample volume counts indicate that about 90 percent of travel occurs between 7 a.m. and 8 p.m. daily (TDOT 2023).

3.10.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, the proposed Project would not be implemented and no direct or indirect impacts to traffic would occur. However, the bridge would continue to require periodic maintenance by TVA and would continue to be considered "load posted," which means the bridge cannot safely carry normal highway loads and has structural issues that require it to be inspected annually. Over a period of time, if no action is taken to address the bridge's condition, the potential for the occurrence of more serious deficiencies

increases, which could risk continued access and travel along Wilbur Dam Road. Future deficiencies have potential to severely limit access to TVA's Watauga Dam and Hydro Plant, the nearby community, and recreation sites.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Under the Proposed Action Alternative, the safety and reliability of the bridge carrying Wilbur Dam Road over Wilbur Reservoir would be improved. The bridge is currently classified as "load posted." Addressing the condition is important, given that the bridge and Wilbur Dam Road serve as the only access point to Watauga Dam, Watauga Hydro Plant, Watauga Dam Campground, and a small community of residences on Lookout Lane and Raven Rock Cove Road. TVA operations and residents in surrounding communities rely on the bridge to access these areas. This alternative would therefore have beneficial long-term impacts for transportation.

Because Wilbur Dam Road is critical to both TVA operations and residents in surrounding communities, the existing bridge would remain open until construction of the new bridge is completed. The phased approach proposed by TVA, with construction of a new bridge followed by demolition of the existing bridge, would result in uninterrupted access to these areas; construction and demolition activities would not result in closure to Wilbur Dam Road for a long period of time.

During construction and demolition, TVA anticipates that there would be minor adverse effects to transportation along Wilbur Dam Road, including lane closures, occasional road closures for short periods of time, and reduction in the width of roadway shoulders or pull-offs. The minor disruption in travel along the roadway would affect the communities, TVA employees, and visitors.

The construction and demolition activities would increase traffic along the Wilbur Dam Road and other roads through the communities west of the Project Area. Travel to the site by approximately 40 employees during the five- or six-day work week would moderately increase traffic. In addition, trucks and other vehicles would deliver materials and equipment to the bridge location and laydown areas during construction and demolition activities. TVA estimates that 10 to 20 trucks would visit the Project Area daily, resulting in up to 20 round trips daily or an additional traffic count of up to 40 vehicles.

Employee and construction vehicles travel to, from, and within the Project Area would result in moderate increases to traffic along the Wilbur Dam Road: between 50 and 70 round trips daily or an additional traffic count of 100 to 140 vehicles daily, which is an increase of about 26% above the five-year annual average daily traffic calculation (2017 to 2022) along the roadway. These moderate impacts would occur during the daytime hours of the five- or six-day work week.

3.11 Noise

3.11.1. Affected Environment

Noise is unwanted or unwelcome sound usually caused by human activity and added to the natural acoustic setting of a locale. It is further defined as sound that disrupts normal activities and diminishes the quality of the environment. Community response to noise is

dependent on the intensity of the sound source, its duration, the proximity of noise-sensitive land uses and the time of day the noise occurs (i.e., higher sensitivities would be expected during the quieter overnight periods). Noise sources relevant to the activities proposed by TVA include noise from the proposed construction activities and from associated transportation along Wilbur Dam Road and in the Project Area.

While the area surrounding the Project Area is primarily forested and undeveloped, there is a small residential area and Watauga Dam Campground located in the vicinity of the Project Area. The proposed laydown areas, #2 and #3, are located on public land across Wilbur Dam Road from the residential area. A church is located to the west of the bridge. Ambient noise surrounding Wilbur Reservoir consists of natural sounds (e.g. wind, wildlife), frequent vehicle use on the Wilbur Dam Road, personal watercraft use on the reservoir, and rural and community noises (i.e., children playing, outdoor lawn equipment).

Generally, noise levels in these types of areas range from 45 to 55 dBA, which are levels below U.S. Environmental Protection Agency recommendations for outdoor residential areas (USEPA 1974). Similarly, the U.S. Department of Housing and Urban Development considers 65 dBA or less to be compatible with residential areas (24 CFR 51.103). According to EPA, typical background day/night noise levels for rural areas range between 35 and 50 dBA whereas higher-density residential and urban areas background noise levels range from 43 dBA to 72 dBA (USEPA 1974). Background noise levels greater than 65 dBA can interfere with normal conversation, watching television, using a telephone, listening to the radio, and sleeping.

3.11.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, the proposed Project would not be implemented and no direct or indirect impacts to noise levels would occur.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

As illustrated in Table 3-6, typical noise levels from construction equipment are expected to be 85 dBA or less at a distance of 50 feet from the construction site. Construction noise would cause temporary and short-term adverse impacts on the ambient sound environment in the vicinity of the project area. These noise levels would typically diminish with distance from the project site at a rate of approximately 6 dBA per each doubling of distance. Therefore, noise would be expected to attenuate to the recommended HUD noise guideline of 65 dBA at approximately 500 feet; however, the levels at this distance would be greater than the EPA guideline of 55 dBA for outdoor residential areas.

Table 3-6. Maximum Noise Levels at 50 feet for Common Construction Equipment

Equipment Type	Maximum Noise Level at 50 feet (dBA)
Air compressor	80
Auger drill	85
Backhoe	80
Boring jack power unit	80
Compactor (ground)	80
Concrete truck	85
Crane – boom truck	85

Source: USDOT 2006

Under the Proposed Action Alternative, TVA would construct a new bridge and subsequently demolish the existing bridge. Elevated noise levels would also occur during site preparation activities and throughout the construction and demolition phases of the project. Noise sources would occur with construction equipment delivering fill material to the site and equipment necessary for placement of the materials. The noise levels associated with the activities would vary in intensity as the construction activities vary. Elevated noise levels are most likely to occur at the bridge location, rather than at the laydown areas.

While the noise from some construction activities and truck/equipment usage would be similar in nature to the noise currently generated from roadway traffic along Wilbur Dam Road, the Proposed Action would increase the frequency and duration of such noise occurring within the Project Area and its vicinity. Noise associated with blasting the concrete piers of the existing bridge during demolition would be greatest (if explosives are used), although it would occur in a short period of time and residents would be alerted to demolition plans prior to those activities. The elevations in noise levels beyond the ambient noise levels in the project area would be intermittent and temporary and cease when construction and demolition is complete.

Elevated noise levels would occur during daylight hours because construction and demolition activities would primarily take place during the daylight hours (about 10 hours a day) of the five- or six-day work week. TVA and its contractors have discretion to establish the start, end, and duration of workdays. It is estimated that it will take approximately 12 to 13 months to complete the Project construction and demolition, with work beginning in 2024 (as currently planned).

Although much of the area surrounding the Project Area is forested and undeveloped land, there are several noise receptors including the residences along Lookout Lane and Raven Rock Cove Road, south of the bridge site, and the TVA Watauga Dam Campground on River Road southwest of the bridge site. How the noise carries across distances is likely to be influenced by the topography, with steep ridges along the reservoir carrying sound to greater distances.

Residences on Lookout Lane are located approximately 650 feet from the bridge, and residences on Raven Rock Cove Road that are closest to the bridge location are approximately 800 feet away. Based on data found in Table 3-6 and considering that noise levels typically diminish with distance from the Project Area at a rate of approximately 6 dBA per each doubling of distance, it is likely that residents closest to

the bridge location would experience noise levels between 61 and 67 dBA. Noise levels would be approximately 61 dBA at 800 feet distance. Noise levels would be marginally lower if there are natural features such as hills or ridges which may shield noise between the construction activities and the residents. (USDOT 2006). Activities occurring at the bridge location are likely therefore to result in moderate to high levels of noise impacts to residents during the daytime and through the construction and demolition period.

Activities in the laydown areas may more frequently result in adverse effects to residents than those activities occurring at the bridge site, given the proximity of the laydown areas to the homes, although noise levels at the laydown areas are expected to be less elevated than those at the bridge location. Laydown area #3 is approximately 250 feet from the closest residence on Raven Rock Cove Road. Laydown area #2 is approximately 300 feet from the closest residence on Lookout Lane. Generally, laydown areas are used for project offices, storage of materials, cleaning activities, and parking of vehicles and equipment. Noise from laydown area activities would primarily be associated with movement and transport of vehicles and equipment, which is more likely to occur periodically and briefly (e.g., as equipment is moved from the laydown area to the bridge site at the beginning and ending of the workday) compared to the types of activities occurring at the bridge site (i.e., occurring throughout the day).

Generally, for residents living near the Project Area who are accustomed to relatively low levels of ambient noise, the Proposed Action would result in moderate to high levels of adverse noise impacts during the workday throughout the project timeline. Noise levels would vary during phases of the project. Adverse effects would be temporary, intermittent, and occur only during the daytime.

TVA's Watauga Dam Campground is located on River Road, approximately 2,250 feet from the bridge (about ½ mile) and approximately 1,200 feet from the nearest construction laydown area. Campers are likely to be adversely affected by noise from construction and demolition activities, as noise carries along the reservoir. Whereas campers would experience primarily natural or highway ambient noise, under normal conditions, there would likely be greater ambient noise associated with construction and equipment during construction and demolition. Such activities would occur during the daytime and therefore would not adversely affect campers during evening, nighttime, or early morning. Given the distance of the campground from the bridge site and laydown areas, noise levels would be unlikely to exceed the HUD guidelines for a residential area (65 dBA). While noticeable, these levels are expected to be minor given that they would be temporary, intermittent, and occur only during the daytime.

Other recreation users, including boaters on the reservoir or visitors to the adjacent wilderness area, would be similarly affected adversely by construction and demolition activities.

Upon completion of construction activities under the Proposed Action, noise levels associated with construction would cease and the ambient sound environment would

return to pre-construction levels. Therefore, the Proposed Action would not affect noise levels after construction is complete.

3.12 Socioeconomics and Environmental Justice

3.12.1. Affected Environment

Carter County, Tennessee is a relatively rural county in upper East Tennessee. The eastern portion of the county borders North Carolina and is characterized by its mountains and forests. Socioeconomic data derived from U.S. Census Bureau data for Carter County is summarized in Table 3-7.

Table 3-7. Demographics Data for Carter County, Tennessee

Statistic	Carter County	State of Tennessee	National
2020 Population	56,452	7,051,339	333,287,557
Median household income	\$44,280	\$58,516	\$69,021
Percent Minority Population	5%	27%	40.7%
Low income (2x the poverty rate)	42%	34%	30%
Unemployment rate	5%	5%	5%

Source: Census Quickfacts, American Community Survey, estimates for 2021 and 2022.

Carter County’s median household income is \$44,280, or 24.3 percent lower than the state’s median income of \$58,516 and 36 percent lower than the national median income of \$69,021. Carter County has a lower percentage of minorities as compared to state and national rates. Although there is a higher poverty rate in Carter County compared to state and national rates, the unemployment rates are similar.

The EPA’s Environmental Justice database (EJScreen) identifies demographic characteristics for those residing within 1 mile of the Wilbur Bridge project site. According to the EJScreen, there are less than 50 people residing within one mile of the bridge site, with an estimated 4 percent identified as a minority population. The data indicates that about half of the population living within 1 mile of the bridge site may be “low income” (i.e., those with earnings twice that of the national poverty level of \$14,580 established by the U.S. Department of Housing and Urban Development).

3.12.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, the proposed Project would not be implemented and no direct impacts to socioeconomic conditions or environmental justice would occur. However, the bridge would continue to require periodic maintenance by TVA and would continue to be considered “load posted.” As previously noted, if no action is taken to address the bridge’s condition, the potential for the occurrence of more serious deficiencies increases over time, which could risk continued access and travel along Wilbur Dam Road. Future

deficiencies have potential to severely affect TVA operations of the Watauga Dam and Hydro Plant, as well as residents in the nearby community, visitors to the TVA recreation sites, and TVA employees at the Watauga Dam and Hydro Plant.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Under the Proposed Action Alternative, TVA would replace the Wilbur Reservoir bridge and demolish the existing bridge. Temporary increases in local or regional employment may occur as a result of construction job opportunities relating to the Project, but these are not likely to contribute significantly toward the economy of the region. As discussed above, it is anticipated that up to 20 vendor haul road trucks/drivers and up to 40 employees would be needed daily during peak construction periods.

The small community along Lookout Lane and Raven Rock Cove Road would be disproportionately impacted by transportation impacts (Section 3.10, Transportation) and noise associated with the construction and demolition activities (Section 3.11, Noise), due to their proximity to construction activities. While noticeable, these impacts would be temporary, intermittent, and occur only during the daytime. In the long term, the bridge replacement would benefit the residents by ensuring safe, long-term access and travel along Wilbur Dam Road.

Several residences closest to laydown areas #2 and #3 are likely to experience minor adverse visual impacts as well that are also temporary. These visual impacts would result from the use of laydown areas #2 and #3, which are areas that are visible from several residences. Tree clearing and the laydown area activities would reduce the natural setting that currently is seen from these residences. These residences would also be most likely to be affected by noise from the laydown area. In addition, TVA would take measures daily to reduce dust (discussed in Section 3.13 below) and to clean the roadway to further reduce potential adverse effects to local residents.

3.13 Air Quality

3.13.1. Affected Environment

The Clean Air Act regulates the emission of air pollutants and, through its implementing regulations, establishes National Ambient Air Quality Standards (NAAQS) for several “criteria” pollutants that are designed to protect the public health and welfare with an ample margin of safety. The criteria pollutants are ozone, particulate matter (PM), carbon monoxide (CO), nitrogen dioxide (NO_x), sulfur dioxide (SO₂), and lead (Pb) (USEPA 2023a).

In accordance with the Clean Air Act Amendments of 1990, all counties are designated with respect to compliance, or degree of noncompliance, with the NAAQS. These designations are either attainment, nonattainment, or unclassifiable. An area with air quality better than the NAAQS is designated as “attainment,” whereas an area with air quality worse than the NAAQS is designated as “non-attainment.” Non-attainment areas are further classified as extreme, severe, serious, moderate, or marginal. An area may be designated as unclassifiable when there is a lack of data to form a basis of attainment status. New or expanded emissions sources located in areas designated as nonattainment for a pollutant are subject to more stringent air permitting requirements (USEPA 2022). Carter County,

Tennessee, where Wilbur Reservoir Bridge is located, is currently in attainment with all NAAQS (USEPA 2023b).

The primary mechanisms for causing potential effects to local air quality considered in this assessment are associated with construction of the new bridge, demolition/removal of the existing bridge, and transportation-related activities. These activities generate fugitive dust, which is commonly measured by the size of PM. Air quality standards of measure for dust are PM10 and PM2.5. In addition, exhaust from internal combustion engines used to power trucks and construction equipment result in emissions that can affect local air quality, particularly if the engines are not properly maintained.

3.13.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, TVA would not build a new bridge and the existing bridge would remain in place. There would be no changes to the existing air quality conditions and no new impacts on air quality.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Under the Proposed Action Alternative, transient air pollutant emissions would occur during the approximately 10-month construction of the new bridge and the 2-month demolition and removal of the existing bridge. Construction-related air quality impacts would primarily result from the staging of construction vehicles, equipment, and supplies in the laydown areas and the operation of construction vehicles and equipment and worker personnel vehicles to accomplish the new bridge construction and existing bridge demolition activities. The daily workforce during peak construction is expected to be approximately 40 workers who would drive to the Project Area and park and 10 to 20 haul trucks.

Combustion of gasoline and diesel fuels by internal combustion engines (vehicles, generators, construction equipment, etc.) would generate local emissions of particulate matter (PM), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), volatile organic compounds, and carbon dioxide (CO₂). However, new emission control technologies and fuel mixtures have significantly reduced vehicle and equipment emissions.

Although the exact equipment is unknown, for this type of project TVA expects the following equipment to be used: truck-mounted crane(s), skid steer loader(s), forklift(s), dump trucks, concrete trucks and pump trucks during deck pours, hand tools (small pneumatic hammer), generators, air compressors, vacuum cleaners, airless spray equipment, abrasive pressure washer, and other miscellaneous equipment. Emissions associated with these vehicles and equipment are expected to result in negligible impacts to air quality because there would be relatively few emissions sources (e.g., trucks, private vehicles) used during construction and use would be temporary. Additionally, it is expected that all vehicles would be properly maintained, which would also reduce emissions.

The emission of fugitive dust during active construction periods could result from a variety of construction activities, including ground disturbances (land clearing and/or grading) from staging the laydown areas and from creating the new roadway alignment on each side of

the new bridge; demolition related activities including the cutting and removal of the existing bridge's concrete deck and the possible blasting of the bridge's steel superstructure before being removed by crane to land; and vehicular traffic over paved roads in the Project Area.

To minimize fugitive dust mobilization, TVA would require all contractors to keep construction equipment properly maintained and to use BMPs (such as covered loads and wet suppression) to implement dust control measures to prevent the spread of dust, dirt, and debris. These methods may include wetting equipment and laydown areas, covering waste or debris piles, using covered containers to haul waste and debris, and cleaning paved roads, including Wilbur Dam Road, daily until construction and demolition activities are complete. TVA would also require onsite contractors to maintain engines and equipment in good working order.

Air quality impacts from construction activities would be temporary (approximately 10 to 11 months for new bridge construction and two months for the existing bridge demolition and removal) and would depend on both human factors (e.g., intensity of activity, control measures) and natural factors such as wind speed and direction. However, even under unusually adverse conditions, these emissions from construction activities would have, at most, a minor transient impact on air quality and would be well below the applicable ambient air quality standards. Overall, the potential impacts to air quality from construction-related activities on local and regional air quality would be temporary and minimal.

3.14 Solid Waste

3.14.1. Affected Environment

Wilbur Reservoir is located in Carter County, Tennessee and near the city of Elizabethton. Solid waste generated in the county is managed by the Carter County government offices. According to the county, solid waste generated by non-municipal entities would ultimately be taken to one of two regional landfills: Advance Disposal (EcoSafe) Landfill or the Iris Glen Environmental Center (FTDD 2016). TVA would work with its construction contractor to determine where the construction and demolition waste would be disposed; these two landfills are the most likely to be used for project activities.

The EcoSafe Landfill, managed by Advanced Disposal and located in Blountville, Tennessee, accepts a variety of waste streams including municipal solid waste, construction and demolition wastes, yard waste, and contaminated soil (Waste Management 2023). This landfill is approximately 27 miles by roadway from the bridge site. The Iris Glen Environmental Center, located in Johnson City, also accepts a variety of waste streams including but not limited to municipal solid waste, construction and demolition debris, and industrial and special waste. This landfill has enough capacity to operate until 2037 (Vance 2017) and is approximately 15.5 miles by roadway from the bridge site. Hazardous waste, if generated, would be disposed of at the Chemical Waste Management facility in Emelle, Alabama.

3.14.2. Environmental Effects

The No Action Alternative

Under the No Action Alternative, the proposed replacement of the Wilbur Reservoir bridge would not occur and no project-related impacts on solid waste management would occur. Therefore, existing waste management conditions likely would remain as they are at present.

The Proposed Action Alternative – Wilbur Reservoir Bridge Replacement

Under the Proposed Action Alternative, construction activities of the replacement bridge would likely generate relatively small amounts of nonhazardous solid waste. Demolition of the existing bridge would generate greater amounts of solid waste. Generally, demolition of the existing bridge would generate several nonhazardous solid waste streams. Soils, rock, concrete, and other bridge materials would be removed for disposal. Because there is lead paint on the steel superstructure of the bridge, TVA would require that the contractor's demolition plan for removal of the steel superstructure portion of the bridge address the appropriate disposal of the hazardous waste materials to prevent dispersal of lead paint chips into the environment. Steel with lead paint may be sent for recycling without being treated as a hazardous waste.

BMPs such as secondary containment for oils/lubricants/fuels, on-site spill containment and remediation supplies, and recurring personnel training would be implemented throughout the duration of the construction to minimize the possibility of spills and to dictate appropriate measures in the event of a spill.

Overall, adverse direct and indirect impacts on solid waste management would be minor and temporary because of the nonhazardous nature of materials (i.e., rock and soil) and construction material waste streams (i.e., cement and grouting materials) associated with the proposed action. Implementation of BMPs and employee/construction contractor training for spill avoidance and spill response/clean-up as a component of the construction work plan would further reduce adverse impacts on solid waste management associated with the Proposed Action.

3.15 Cumulative Impacts

Cumulative impacts on the environment results from the incremental impact of the action when added to the impacts of other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. TVA identified several present and reasonably foreseeable future actions within the Project Area and its vicinity for consideration in the cumulative impacts. No past actions were identified that would be relevant to the consideration of cumulative impacts.

TVA's ongoing operations of the Wilbur and Watauga hydro facilities are activities that result in regular traffic along Wilbur Dam Road. TVA also conducts routine maintenance actions at the Watauga Dam Visitors Center, the Watauga Dam Campground and its nearby boat ramp. There are several maintenance actions planned in the coming years at Watauga Hydro Plant, including the replacement of butterfly valves and a transformer that is planned for late 2024, during Project construction. Maintenance actions are planned at

Wilbur Hydro Plant in 2024 as well (i.e., replacement of an excitation system). As noted in the Transportation section, the Proposed Action Alternative would contribute to transportation impacts along Wilbur Dam Road and nearby roadways. These ongoing and planned activities would individually result in minor transportation impacts along Wilbur Dam Road and roadways in the nearby community. Cumulatively, however, transportation impacts when activities are occurring concurrently (in 2024) would be moderate. However, Wilbur Dam Road and area roadways provide sufficient infrastructure and capacity to accommodate the temporary increases in traffic.

In addition, TVA is proposing to conduct aquatic herbicide treatment in portions of Wilbur Reservoir during 2024 to manage submersed aquatic vegetation that has become prevalent. Historically the primary aquatic plant has been Curly-leaf pondweed (*Potamogeton crispus*) and it has increased in coverage area and density over the last several years. These increases have created impingement issues at the Wilbur Hydroelectric Plant facility. The treatment area totals approximately 8.1 acres and includes two areas of the reservoir by the bridge and shoreline within or adjacent to the Project Area. Such treatments would eradicate the Curly-leaf pondweed and would result in negligible, temporary impacts on water quality in the reservoir, including within the vicinity of the bridge. The herbicide treatments would be concluded before the bridge replacement project begins. There would be no incremental cumulative impact of the Project when added to the effects of TVA's planned herbicide treatments.

The amount of waste that would be transported to and stored at the Advance Disposal (EcoSafe) Landfill or the Iris Glen Environmental Center during construction and demolition activities would contribute to cumulative impacts related to waste management in the vicinity of the project. Given the volume that would be generated under the Project however, there would be a negligible effect on the waste disposal capacities of these landfills, given the capacities of the two facilities.

3.16 Unavoidable Adverse Environmental Impacts

This section describes principal unavoidable adverse environmental impacts associated with implementation of the Proposed Action Alternative, for which mitigation measures are considered either impracticable, do not exist, or cannot entirely eliminate the impact. Under the Proposed Action Alternative, the replacement of the bridge would render the land occupied by the new roadway alignment permanently unavailable for other uses. Tree removal for laydown areas is unavoidable, although TVA would revegetate the areas at the conclusion of the Project. Noise during construction activities adversely affecting residents or visitors near the Project Area are also unavoidable.

3.17 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses are those that generally occur on a year-to-year basis. Examples are wildlife use of forage, timber management, recreation, and uses of water resources. Long-term productivity is the capability of the land to provide resources, both market and nonmarket, for future generations. Long-term impacts would be those that last beyond the life of the project.

The Proposed Action Alternative would remove vegetation and result in new or additional grading within the Project Area. It would also convert portions of forested areas into temporary laydown areas (e.g., at laydown areas #2 and #3). Short-term impacts to productivity could include disruptions to wildlife in the vicinity of the project area as a result of construction and temporary disturbances. There would also be short-term impacts to access and transportation along Wilbur Dam Road. The construction activities would cause a minor long-term loss of productivity and wildlife habitat. Bridge replacement would result in long-term beneficial socioeconomic and transportation impacts that over time are important to TVA, nearby residents, and visitors and recreationists.

3.18 Irreversible and Irrecoverable Commitments of Resources

As used here, irreversible commitments of resources include the use or consumption of nonrenewable resources because of a decision or implementing a proposed action (for example, extracting ore is an irreversible commitment of the resource). Irrecoverable commitments involve the use or commitment of resources for a period of time, even a long period.

Implementation of the Proposed Action Alternative would result in the irreversible commitment of vegetation and forest habitat in the Project Area, particularly in the laydown areas #2 and #3. These commitments would not be irrecoverable, however, because the vegetation and trees would eventually grow back in those areas. Materials used in the new bridge would be an irrecoverable commitment of resources.

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CHAPTER 4 - LIST OF PREPARERS

4.1 NEPA Project Management

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Position: Environmental Scientist
Education: M.S., Wildlife Management; B.S., Biology
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Involvement: Project management, document preparation, environmental permitting oversight

Matthew Higdon

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Wilbur Reservoir Bridge Replacement

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CHAPTER 5 - LITERATURE CITED

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Appendix A – Relevant Correspondence



STATE OF TENNESSEE

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Natural Areas
Natural Heritage Program
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 2nd Floor
Nashville, Tennessee 37243
Phone 615/532-4799 Fax 615/532-0046

May 11, 2023

David Mitchell
TVA
400 West Summit Hill Drive
Knoxville, TN 37902

Subject: Wilbur Bridge Project
Northern Extent: (36.34007°, -82.11688°)
Western Extent: (36.33638°, -82.12283°)
Southern Extent: (36.33362°, -82.11852°)
Carter County, TN
Rare Species Database Review

Dear Mr. Mitchell:

Thank you for your correspondence of 3 April 2023 requesting a rare species database review for the proposed bridge replacement project in Carter County, Tennessee.

Per your submittal:

*TVA is replacing the bridge at Wilbur Reservoir. During our field surveys in January of 2023 we documented three individuals of *Geum laciniatum*, a state listed special concern species, in the construction footprint. TVA plans to relocate these species outside the construction footprint in a suitable habitat. The latest full survey of the area counted 65 individuals of *Geum laciniatum* present in the surrounding area. Past experience of transplanting *Geum* spp. by TVA botanists were proven to be successful.*

Per our correspondence of 11 May 2023, you also surveyed for *Buckleya distichophylla*, which has been documented from the immediate vicinity, but it was not present within the project area.

We have reviewed the state's natural heritage database with regard to the project boundaries, and we find that the following rare species have been observed previously within one mile of the project area:

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	<i>Buckleya distichophylla</i>	Piratebush	G3	S2	--	T	Rocky Mountain Woods W/ Hemlock

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	<i>Corydalis sempervirens</i>	Pale Corydalis	G5	S1S2	--	S	Dry Or Rocky Woods
Vascular Plant	<i>Cymophyllus fraserianus</i>	Fraser's Sedge	G4	S3	--	S	Mixed Mesophytic Forests
Vascular Plant	<i>Didiplis diandra</i>	Water-purslane	G5	S1	--	T	Swamps
Vascular Plant	<i>Geum laciniatum</i>	Rough Avens	G5	S1	--	S	Lake Margins
Vascular Plant	<i>Sparganium androcladum</i>	Branching Bur-reed	G4G5	S1	--	E	Slow Flowing Streams and Rivers, Ponds
Vascular Plant	<i>Tsuga caroliniana</i>	Carolina Hemlock	G2G3	S3	--	T	Dry Ridges
Vascular Plant	<i>Woodsia scopulina ssp. appalachiana</i>	Alleghany Cliff-fern	G4	S1S2	--	S	Mountain Cliffs
Invertebrate Animal	<i>Speyeria diana</i>	Diana Fritillary	G2G3	S3	--	Rare, Not State Listed	Fields, edges, and openings in moist, rich, forested mountains and valleys; Blue Ridge & Cumberland Plateau generally.
Vertebrate Animal	<i>Limnothlypis swainsonii</i>	Swainson's Warbler	G4	S3	--	D	Mature, rich, damp, deciduous floodplain and swamp forests.

Within four miles of the project area the following additional rare species have been reported:

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	<i>Adlumia fungosa</i>	Climbing Fumitory	G4	S2	--	T	Rich Mesic Woods
Vascular Plant	<i>Caltha palustris</i>	Marsh Marigold	G5	S1	--	E	Bogs
Vascular Plant	<i>Campanula aparinoides</i>	Marsh Bellflower	G5	S2	--	S	Bogs
Vascular Plant	<i>Carex hitchcockiana</i>	Hitchcock's Sedge	G5	S1	--	T	Rich Moist Woods
Vascular Plant	<i>Gratiola viscidula</i>	Short's Hedge-hyssop	G4G5	S1	--	S	Streamsides, Pond Edges, And Other Wet Areas
Vascular Plant	<i>Hydrophyllum virginianum</i>	Appalachian Waterleaf	G5	S3	--	T	Alluvial Woods
Vascular Plant	<i>Hypericum ellipticum</i>	Pale St. John's-wort	G5	S1	--	E	Bogs
Vascular Plant	<i>Meehania cordata</i>	Heartleaf Meehania	G5	S2	--	T	Wooded Mountain Slopes
Vascular Plant	<i>Minuartia godfreyi</i>	Godfrey's Stitchwort	G1	S1	--	E	Wet Meadows And Marshes
Vascular Plant	<i>Panax quinquefolius</i>	American Ginseng	G3G4	S3S4	--	S-CE	Rich Woods

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vascular Plant	<i>Symplocarpus foetidus</i>	Skunk-cabbage	G5	S1	--	E	Swamps And Bogs
International Vegetation Classification - Natural	<i>Tilia americana</i> var. <i>heterophylla</i> - <i>Fraxinus americana</i> / <i>Sanguinaria canadensis</i> - (<i>Aquilegia canadensis</i> , <i>Asplenium rhizophyllum</i>) Forest	Southern Appalachian Cove Forest (Rich Foothill Type)	G2G3	S2S3	--	Rare, Not State Listed	<Null>
Invertebrate Animal	<i>Nesticus paynei</i>	A Cave Spider	G3G4	S3	--	Rare, Not State Listed	Terrestrial cave associate; also may be found on surface; northern Ridge & Valley.
Invertebrate Animal	<i>Triodopsis anteridon</i>	Carter Threetooth	G3	S1S2	--	Rare, Not State Listed	In leaf litter or on logs on forested slopes and in ravines; Blue Ridge; far northeast Tennessee.
Invertebrate Animal	<i>Vertigo clappi</i>	Cupped Vertigo	G1G2	S1	--	Rare, Not State Listed	In leaf litter and moss on forested hillsides; Blue Ridge; Monroe County.
Vertebrate Animal	<i>Cryptobranchus alleganiensis</i>	Hellbender	G3	S3	--	E	Rocky, clear creeks and rivers with large shelter rocks.
Vertebrate Animal	<i>Neotoma magister</i>	Allegheny Woodrat	G3G4	S3	--	D	Outcrops, cliffs, talus slopes, crevices, sinkholes, caves & karst.
Vertebrate Animal	<i>Percina williamsi</i>	Sickle Darter	G2	S2	PT	T	Flowing pools over rocky, sandy, or silty substrates in clear creeks or small rivers; upper Tennessee River system; east TN.

The Division of Natural Areas - Natural Heritage Program has reviewed the location of the proposed project workspace with respect to rare plant species. Our office appreciates your proactive surveys and support your plan to relocate a population of *Geum lacinatum* to suitable habitat outside of the project area, provided that you provide location information and notes on the transplanting process following the proposed activity, such that we may map the new location in the TDEC Natural Heritage Database. Based on your surveys, we do not anticipate impacts to any other rare plant species known from the project vicinity.

We ask that you coordinate this project with the Tennessee Wildlife Resources Agency (Region 4, Rob Lindbom, dennis.lindbom@tn.gov) to ensure that legal requirements for protection of state listed rare animals are addressed. Additionally, the U.S. Fish and Wildlife Service has authority over federally listed

plants and animals. If your project review list includes federally listed plant or animal species, and you would like a review from the U.S. Fish and Wildlife Service, please follow the instructions for submitting a review request provided at <https://www.fws.gov/media/tn-es-project-review-requests-guidance>. Please ensure that best management practices to address erosion and sediment are implemented and maintained during construction activities. Note that the [General Aquatic Resource Alteration Permit](#) states that “use of monofilament-type erosion control netting or blanket is prohibited in the stream channel, stream banks, or any disturbed riparian areas within 30 feet of top of bank.” Where necessary and feasible, we encourage use of biodegradable netting under the CGP (Construction General Stormwater Permit) as well.

Thank you for considering Tennessee’s rare species throughout the planning of this project. Should you have any questions, please do not hesitate to contact me at 615-532-4799 or dillon.blankenship@tn.gov.

Sincerely,

Dillon

Dillon Blankenship | Environmental Review Coordinator
Tennessee Natural Heritage Program



400 West Summit Hill Drive, Knoxville, Tennessee 37902

May 10, 2023

Mr. E. Patrick McIntyre, Jr.
Executive Director
and State Historic Preservation Officer
Tennessee Historical Commission
2941 Lebanon Road
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), WILBUR RESERVOIR BRIDGE REPLACEMENT, CARTER COUNTY, TENNESSEE (36.33811, -82.11673)-- PHASE I CULTURAL RESOURCES (TVA TRACKING NUMBER – CID 81338)

TVA proposes to replace the existing Wilbur Dam Road Bridge (Figure 1) with a new bridge. Wilbur Dam Road Bridge is located in Carter County, Tennessee and carries the Wilbur Dam Road over the Watauga River, which is impounded by Wilbur Dam (Figure 2). TVA is proposing to construct a new concrete bridge just downstream of the existing bridge (Figure 3) and then demolish and remove the existing bridge. TVA finds that the proposed project constitutes an undertaking (as defined at 36 CFR § 800.16 (y)) that has the potential to cause effects to historic properties.

We have consulted with your office previously on two occasions regarding a geotechnical study that was completed to provide data needed in designing the new bridge. TVA completed a desktop review and field review and proposed a finding of no effects to historic properties. Your office agreed by letters dated January 5 and May 12, 2022.

TVA proposes that the undertaking's area of potential effects (APE) should consist of all areas where ground disturbance would occur as a result of the project and areas within one-half mile from which the new bridge would be visible. This includes the location of the new bridge, slight changes in the road alignment, concrete retaining wall, a parking area, and two temporary construction laydown areas. The APE should also include the existing bridge, as it is a potentially historic resource that would be removed.

TVA contracted with Cultural Resource Associates, Inc. (CRA) for a phase I cultural resources survey of the APE. The investigation included an archaeological survey of the project footprint and a survey of historic architectural resources in the APE. To identify the APE in the half-mile radius (areas from which the new bridge would be visible), CRA used GIS software to create a viewshed model that took into consideration topography, vegetation, the built environment, and the assumed elevation of the new bridge (no more than six feet higher than the existing bridge). The draft report, titled, *Phase I Cultural Resources Survey for the Proposed Wilbur Dam Road*

Mr. E. Patrick McIntyre, Jr.
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May 10, 2023

Bridge Replacement, Carter County, Tennessee is uploaded as part of this consultation package.

CRA's background research indicated that no archaeological surveys have been carried out in the project footprint previously, and there are no previously recorded sites in the footprint. This research also noted that the project footprint overlaps the boundaries of two properties listed in the National Register of Historic Places (NRHP): the Wilbur Hydroelectric Project and the Watauga Hydroelectric Project.

The archaeological survey identified three archaeological sites (40CR264 - 40CR266). All three sites consist of small, low-density scatters of historic artifacts associated with the past locations of historic structures that were constructed for the Watauga Hydroelectric Project and demolished after construction, probably in 1949. All three are in locations disturbed by road construction or erosion post-dating 1949. CRA recommends that sites 40CR264 and 40CR265 are ineligible for the NRHP.

Site 40CR266 is associated with a dormitory that was used to house African American workers during construction of Watauga Dam. This site contains a stone feature consisting of a pile of limestone blocks. CRA's research indicates this feature is historic and was created during the Watauga Dam construction project. CRA recommends that while most of site 40CR266 lacks data important in history or prehistory, an upper terrace extending west from the investigated site has potential for deposits that could provide data important to an understanding of the workers' camp. Most of the area with such potential lies outside the project area, but a small section of it is within the western extremity of the proposed laydown area. CRA recommends that TVA exclude that area (as indicated in Figures 4 and 5) to avoid potential adverse effects to the archaeological site. Please note that the site 40CR266 site boundary identified by the survey is limited to the investigated area. The site boundary does not include the hypothetical extension of the site to the west, on the upper terrace where intact buried deposits may be located. A complete delineation of the site boundary would require additional investigation.

Based on this survey, TVA has determined that sites 40CR264 and 40CR265 are ineligible for the NRHP and site 40CR266 should be considered potentially eligible due to the potential presence of intact archaeological deposits relating to the Watauga Dam Construction Camp. Activity within the site boundary would consist of the temporary storage of vehicles and materials during construction. TVA proposes to avoid adverse effects to this site by flagging the western portion of the site within the project area (as indicated in Figures 4 and 5) with high visibility flagging tape during construction, recording this as a "sensitive area" on design drawings, and requiring the construction crew to exclude the sensitive area from use. These measures would ensure no vegetation clearing, vehicle use, or ground disturbing activities occur in the sensitive area. TVA finds that with these measures in place the undertaking will avoid adverse effects on potentially eligible site 40CR266.

The historic architectural survey noted that the proposed bridge would not be visible from either dam or from any of the contributing resources of either properties. Three structures that are part of the Wilbur Hydroelectric plant are within the viewshed of the proposed bridge. However,

Mr. E. Patrick McIntyre, Jr.
Page 3
May 10, 2023

these structures are all younger than the period of significance for the NRHP-listed property and lack historic, architectural, and engineering significance. The existing Wilbur Bridge also lacks historic significance; CRA recommends that this bridge is ineligible for the NRHP. CRA recommends that the proposed project would not adversely affect any properties listed in, or eligible for listing in, the NRHP.

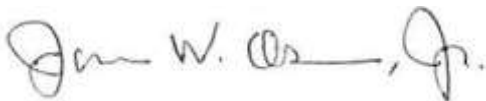
TVA has reviewed the enclosed report and agrees with CRA's recommendations. TVA finds that this undertaking would not affect any historic properties.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding properties within the proposed project's APE that may be of religious and cultural significance to them and eligible for the NRHP.

Pursuant to 36 CFR Part 800.5(c) we are notifying you of TVA's finding of no adverse effect; providing the documentation specified in § 800.11(e); and inviting you to review the finding. Also, we are seeking your agreement with TVA's eligibility determinations and finding that the undertaking as currently planned will have no adverse effects on historic properties.

Please contact Steve Cole by email, sccole0@tva.gov with your comments.

Sincerely,



James W. Osborne, Jr.
Manager
Cultural Compliance

SCC:ERB
Enclosure
cc (Enclosure):

Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210



Figure 1. The existing Wilbur Reservoir Bridge, carrying Wilbur Dam Road over Wilbur Reservoir. View to north.

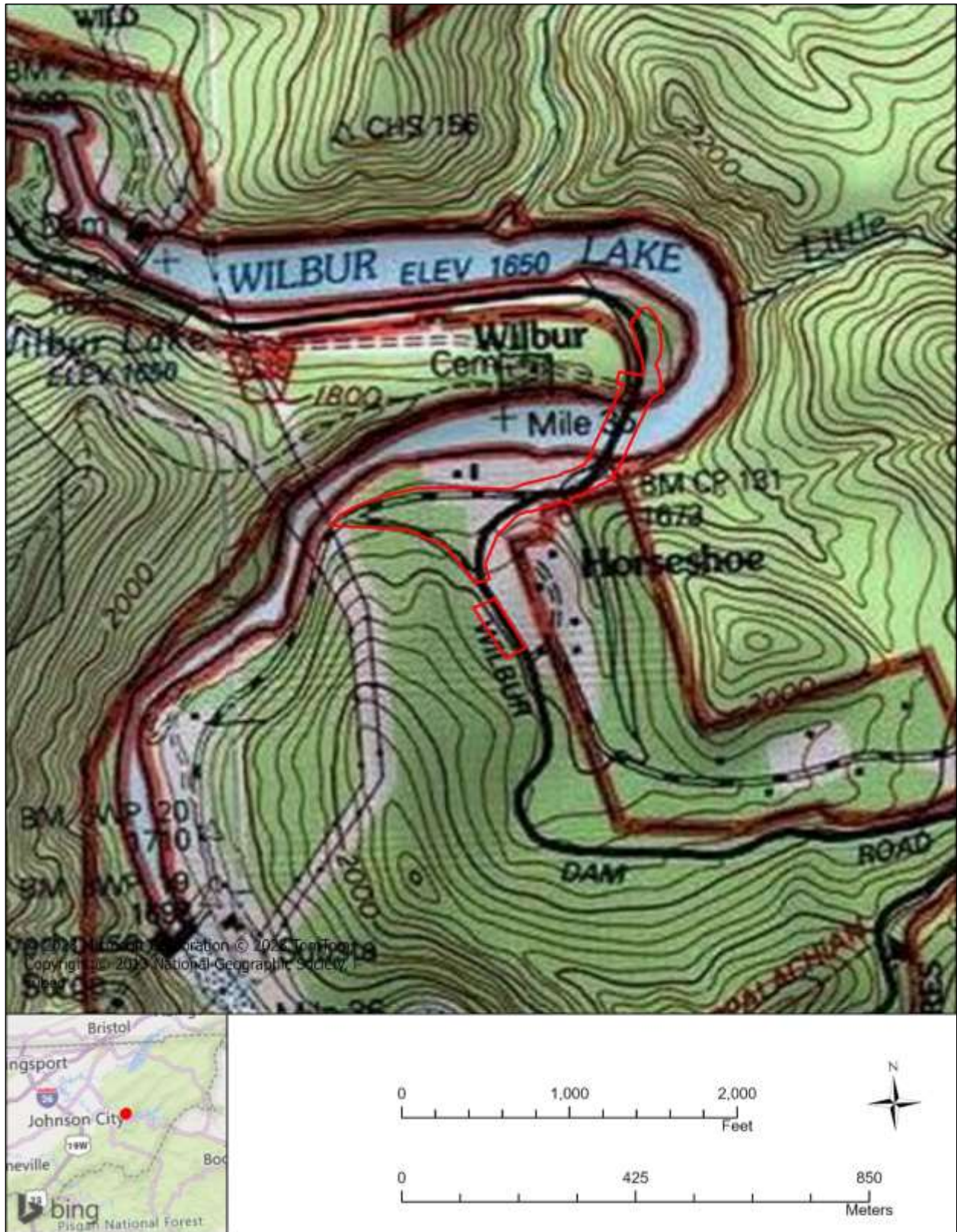


Figure 2. Project location. Base map: USGS Watauga Dam, TN 7.5-minute topographic quadrangle (ESRI edition).



Figure 3. Proposed location of new bridge.

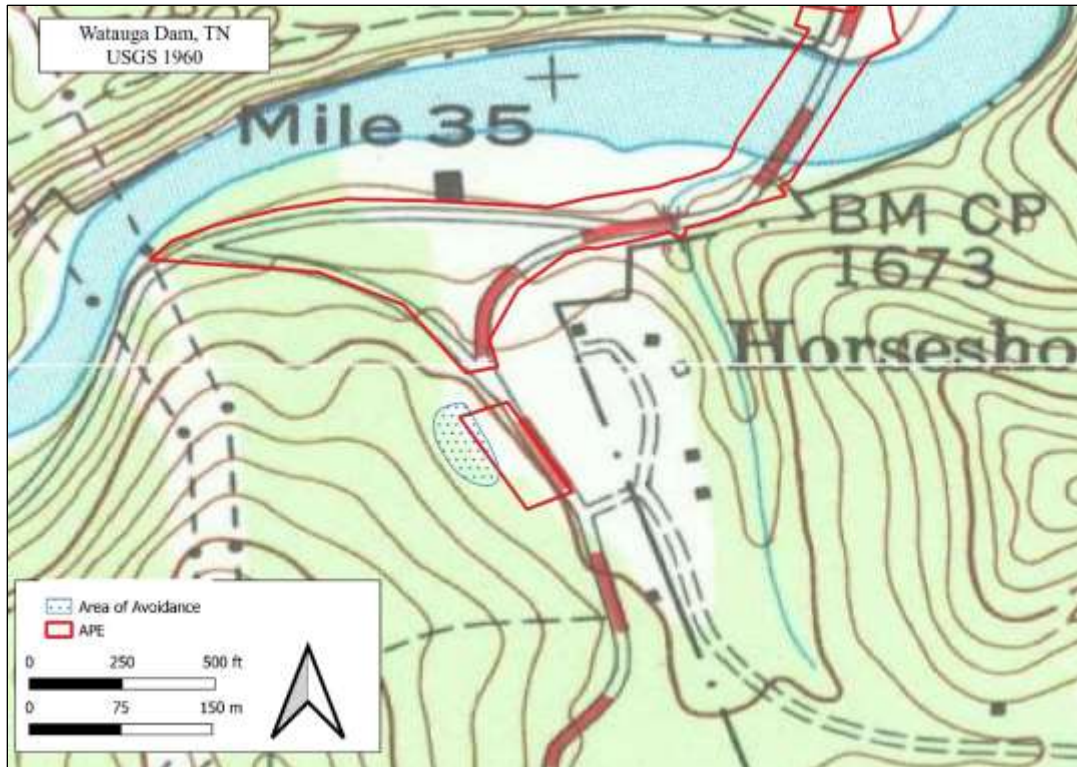


Figure 4. Area to be avoided within proposed laydown yard that falls partially within 40CR266.

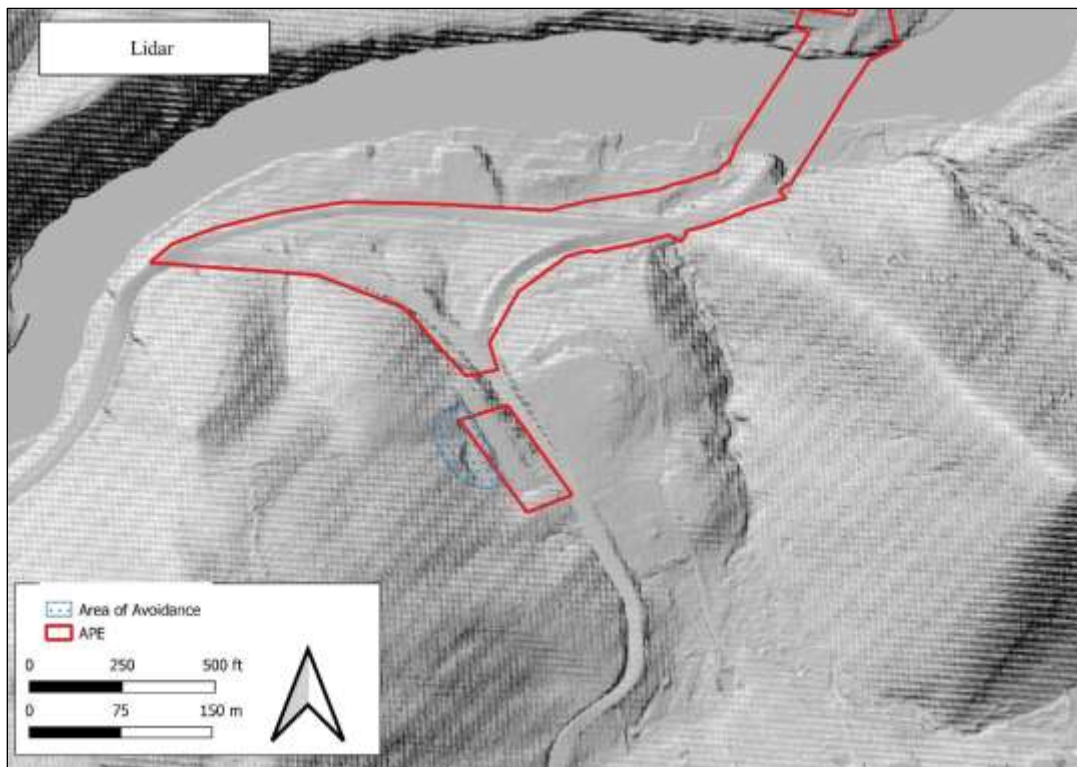


Figure 5. Area to be avoided within proposed laydown yard; base map shows terrain.

Cole, Steve C

From: TN Help <tnhelp@service-now.com>
Sent: Thursday, May 25, 2023 4:45 PM
To: Osborne, James W Jr; Beliles, Emily
Cc: Cole, Steve C
Subject: Wilbur Reservoir Bridge Replacement, TVA Tracking Number- CID 81338 - Project # SHPO0003119
Attachments: e106 Updates_READ ME.pdf

This is an **EXTERNAL EMAIL** from outside TVA. **THINK BEFORE** you **CLICK** links or **OPEN** attachments. If suspicious, please click the **"Report Phishing"** button located on the Outlook Toolbar at the top of your screen.



TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

2023-05-25 15:24:06 CDT

James Osborn
Tennessee Valley Authority
jwosborn@tva.gov

RE: Tennessee Valley Authority (TVA), Wilbur Reservoir Bridge Replacement, TVA Tracking Number- CID 81338, Project#: SHPO0003119, Carter County, TN

Dear Mr. James Osborn:

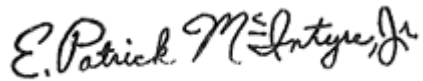
Pursuant to your request, this office has reviewed documentation concerning the above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Based on the information provided, we concur that the Wilbur Bridge is not eligible for listing in the National Register on the basis that prior determinations found the bridge not eligible, and that additional information demonstrated the tenuous significance of the bridge with Wilbur Dam. We concur that sites 40CR264 and 40CR265 are not eligible.

We further find that the project as currently proposed will not adversely affect the Wilbur Hydroelectric Project.

This office has no objection to the implementation of this project as currently planned. If project plans are changed or previously unevaluated archaeological resources are discovered during project construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. Include the Project # if you need to submit any additional information regarding this undertaking. Questions and comments may be directed to Kelley Reid, who drafted this response, at Kelley.Reid@tn.gov, +16157701099. We appreciate your cooperation.

Sincerely,

A handwritten signature in black ink that reads "E. Patrick McIntyre, Jr." in a cursive script.

E. Patrick McIntyre, Jr.
Executive Director and#
State Historic Preservation Officer#

Ref:MSG8442802_esERbQRfMkLyODK8zkod

Appendix B – Photographs of Proposed Laydown Areas

Laydown Area #1 (Roadway South of Bridge):



Laydown Area #2 (Across from TVA Maintenance Base on River Road):



Laydown Area #3 (on Wilbur Dam Road across from homes):



Above - Intersection of Raven Rock Cove Road and Wilbur Dam Road.



Appendix C – TVA Bat Strategy Project Review Form

Project Review Form - TVA Bat Strategy (06/2019)

This form should **only** be completed if project includes activities in Tables 2 or 3 (STEP 2 below). This form is not required if project activities are limited to Table 1 (STEP 2) or otherwise determined to have no effect on federally listed bats. If so, include the following statement in your environmental compliance document (e.g., add as a comment in the project CEC): "Project activities limited to Bat Strategy Table 1 or otherwise determined to have no effect on federally listed bats. Bat Strategy Project Review Form NOT required." This form is to assist in determining required conservation measures per TVA's ESA Section 7 programmatic consultation for routine actions and federally listed bats.¹

Project Name: Wilbur Reservoir Bridge Replacement **Date:** Feb 11, 2023
Contact(s): J.B. Brellenthin **CEC#:** **Project ID:**
Project Location (City, County, State): Carter County, Tennessee

Project Description:

TVA Facilities Asset Management is proposing to replace an existing bridge, Wilbur Reservoir Bridge, with a new concrete bridge just downstream of the existing bridge. TVA is proposing to remove the existing bridge after completion of the new bridge.

SECTION 1: PROJECT INFORMATION - ACTION AND ACTIVITIES

STEP 1) Select TVA Action. If none are applicable, contact environmental support staff, Environmental Project Lead, or Terrestrial Zoologist to discuss whether form (i.e., application of Bat Programmatic Consultation) is appropriate for project:

- | | |
|---|--|
| <input type="checkbox"/> 1 Manage Biological Resources for Biodiversity and Public Use on TVA Reservoir Lands | <input type="checkbox"/> 6 Maintain Existing Electric Transmission Assets |
| <input type="checkbox"/> 2 Protect Cultural Resources on TVA-Retained Land | <input type="checkbox"/> 7 Convey Property associated with Electric Transmission |
| <input type="checkbox"/> 3 Manage Land Use and Disposal of TVA-Retained Land | <input type="checkbox"/> 8 Expand or Construct New Electric Transmission Assets |
| <input type="checkbox"/> 4 Manage Permitting under Section 26a of the TVA Act | <input type="checkbox"/> 9 Promote Economic Development |
| <input checked="" type="checkbox"/> 5 Operate, Maintain, Retire, Expand, Construct Power Plants | <input type="checkbox"/> 10 Promote Mid-Scale Solar Generation |

STEP 2) Select all activities from Tables 1, 2, and 3 below that are included in the proposed project.

TABLE 1. Activities with no effect to bats. Conservation measures & completion of bat strategy project review form NOT required.

<input type="checkbox"/> 1. Loans and/or grant awards	<input type="checkbox"/> 8. Sale of TVA property	<input type="checkbox"/> 19. Site-specific enhancements in streams and reservoirs for aquatic animals
<input type="checkbox"/> 2. Purchase of property	<input type="checkbox"/> 9. Lease of TVA property	<input type="checkbox"/> 20. Nesting platforms
<input type="checkbox"/> 3. Purchase of equipment for industrial facilities	<input type="checkbox"/> 10. Deed modification associated with TVA rights or TVA property	<input type="checkbox"/> 41. Minor water-based structures (this does not include boat docks, boat slips or piers)
<input type="checkbox"/> 4. Environmental education	<input type="checkbox"/> 11. Abandonment of TVA retained rights	<input type="checkbox"/> 42. Internal renovation or internal expansion of an existing facility
<input type="checkbox"/> 5. Transfer of ROW easement and/or ROW equipment	<input type="checkbox"/> 12. Sufferance agreement	<input type="checkbox"/> 43. Replacement or removal of TL poles
<input type="checkbox"/> 6. Property and/or equipment transfer	<input type="checkbox"/> 13. Engineering or environmental planning or studies	<input type="checkbox"/> 44. Conductor and overhead ground wire installation and replacement
<input type="checkbox"/> 7. Easement on TVA property	<input type="checkbox"/> 14. Harbor limits delineation	<input type="checkbox"/> 49. Non-navigable houseboats

TABLE 2. Activities not likely to adversely affect bats with implementation of conservation measures. Conservation measures and completion of bat strategy project review form REQUIRED; review of bat records in proximity to project NOT required.

<input type="checkbox"/> 18. Erosion control, minor	<input type="checkbox"/> 57. Water intake - non-industrial	<input type="checkbox"/> 79. Swimming pools/associated equipment
<input type="checkbox"/> 24. Tree planting	<input type="checkbox"/> 58. Wastewater outfalls	<input type="checkbox"/> 81. Water intakes – industrial
<input type="checkbox"/> 30. Dredging and excavation; recessed harbor areas	<input type="checkbox"/> 59. Marine fueling facilities	<input type="checkbox"/> 84. On-site/off-site public utility relocation or construction or extension
<input type="checkbox"/> 39. Berm development	<input type="checkbox"/> 60. Commercial water-use facilities (e.g., marinas)	<input type="checkbox"/> 85. Playground equipment - land-based
<input type="checkbox"/> 40. Closed loop heat exchangers (heat pumps)	<input type="checkbox"/> 61. Septic fields	<input type="checkbox"/> 87. Aboveground storage tanks
<input type="checkbox"/> 45. Stream monitoring equipment - placement and use	<input type="checkbox"/> 66. Private, residential docks, piers, boathouses	<input type="checkbox"/> 88. Underground storage tanks
<input type="checkbox"/> 46. Floating boat slips within approved harbor limits	<input type="checkbox"/> 67. Siting of temporary office trailers	<input type="checkbox"/> 90. Pond closure
<input checked="" type="checkbox"/> 48. Laydown areas	<input type="checkbox"/> 68. Financing for speculative building construction	<input type="checkbox"/> 93. Standard License
<input type="checkbox"/> 50. Minor land based structures	<input type="checkbox"/> 72. Ferry landings/service operations	<input type="checkbox"/> 94. Special Use License
<input type="checkbox"/> 51. Signage installation	<input type="checkbox"/> 74. Recreational vehicle campsites	<input type="checkbox"/> 95. Recreation License
<input type="checkbox"/> 53. Mooring buoys or posts	<input type="checkbox"/> 75. Utility lines/light poles	<input type="checkbox"/> 96. Land Use Permit
<input type="checkbox"/> 56. Culverts	<input type="checkbox"/> 76. Concrete sidewalks	

Table 3: Activities that may adversely affect federally listed bats. Conservation measures AND completion of bat strategy project review form REQUIRED; review of bat records in proximity of project REQUIRED by OSAR/Heritage eMap reviewer or Terrestrial Zoologist.

<input checked="" type="checkbox"/> 15. Windshield and ground surveys for archaeological resources	<input checked="" type="checkbox"/> 34. Mechanical vegetation removal, includes trees or tree branches > 3 inches in diameter	<input type="checkbox"/> 69. Renovation of existing structures
<input type="checkbox"/> 16. Drilling	<input type="checkbox"/> 35. Stabilization (major erosion control)	<input type="checkbox"/> 70. Lock maintenance/ construction
<input type="checkbox"/> 17. Mechanical vegetation removal, does not include trees or branches > 3" in diameter (in Table 3 due to potential for woody burn piles)	<input checked="" type="checkbox"/> 36. Grading	<input type="checkbox"/> 71. Concrete dam modification
<input type="checkbox"/> 21. Herbicide use	<input type="checkbox"/> 37. Installation of soil improvements	<input type="checkbox"/> 73. Boat launching ramps
<input type="checkbox"/> 22. Grubbing	<input type="checkbox"/> 38. Drain installations for ponds	<input type="checkbox"/> 77. Construction or expansion of land-based buildings
<input type="checkbox"/> 23. Prescribed burns	<input type="checkbox"/> 47. Conduit installation	<input type="checkbox"/> 78. Wastewater treatment plants
<input checked="" type="checkbox"/> 25. Maintenance, improvement or construction of pedestrian or vehicular access corridors	<input type="checkbox"/> 52. Floating buildings	<input type="checkbox"/> 80. Barge fleeting areas
<input type="checkbox"/> 26. Maintenance/construction of access control measures	<input type="checkbox"/> 54. Maintenance of water control structures (dewatering units, spillways, levees)	<input type="checkbox"/> 82. Construction of dam/weirs/ levees
<input type="checkbox"/> 27. Restoration of sites following human use and abuse	<input type="checkbox"/> 55. Solar panels	<input type="checkbox"/> 83. Submarine pipeline, directional boring operations
<input type="checkbox"/> 28. Removal of debris (e.g., dump sites, hazardous material, unauthorized structures)	<input checked="" type="checkbox"/> 62. Blasting	<input type="checkbox"/> 86. Landfill construction
<input type="checkbox"/> 29. Acquisition and use of fill/borrow material	<input type="checkbox"/> 63. Foundation installation for transmission support	<input type="checkbox"/> 89. Structure demolition
<input checked="" type="checkbox"/> 31. Stream/wetland crossings	<input type="checkbox"/> 64. Installation of steel structure, overhead bus, equipment, etc.	<input checked="" type="checkbox"/> 91. Bridge replacement
<input type="checkbox"/> 32. Clean-up following storm damage	<input type="checkbox"/> 65. Pole and/or tower installation and/or extension	<input type="checkbox"/> 92. Return of archaeological remains to former burial sites
<input type="checkbox"/> 33. Removal of hazardous trees/tree branches		

STEP 3) Project includes one or more activities in Table 3?

YES (Go to Step 4)

NO (Go to Step 13)

STEP 4) Answer questions a through e below (applies to projects with activities from Table 3 ONLY)

- a) Will project involve continuous noise (i.e., ≥ 24 hrs) that is greater than 75 decibels measured on the A scale (e.g., loud machinery)? **NO** (NV2 does not apply) **YES** (NV2 applies, subject to records review)
- b) Will project involve entry into/survey of cave? **NO** (HP1/HP2 do not apply) **YES** (HP1/HP2 applies, subject to review of bat records)
- c) If conducting **prescribed burning (activity 23)**, estimated acreage: and timeframe(s) below; **N/A**

STATE	SWARMING	WINTER	NON-WINTER	PUP
GA, KY, TN	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Mar 31	<input type="checkbox"/> Apr 1 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
VA	<input type="checkbox"/> Sep 16 - Nov 15	<input type="checkbox"/> Nov 16 - Apr 14	<input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 15	<input type="checkbox"/> Jun 1 - Jul 31
AL	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Mar 15	<input type="checkbox"/> Mar 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
NC	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Apr 15	<input type="checkbox"/> Apr 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
MS	<input type="checkbox"/> Oct 1 - Nov 14	<input type="checkbox"/> Nov 15 - Apr 14	<input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 30	<input type="checkbox"/> Jun 1 - Jul 31

- d) Will the project involve vegetation piling/burning? **NO** (SSPC4/SHF7/SHF8 do not apply) **YES** (SSPC4/SHF7/SHF8 applies, subject to review of bat records)

- e) If **tree removal (activity 33 or 34)**, estimated amount: **ac** **trees** **N/A**

STATE	SWARMING	WINTER	NON-WINTER	PUP
GA, KY, TN	<input checked="" type="checkbox"/> Oct 15 - Nov 14	<input checked="" type="checkbox"/> Nov 15 - Mar 31	<input checked="" type="checkbox"/> Apr 1 - May 31, Aug 1 - Oct 14	<input checked="" type="checkbox"/> Jun 1 - Jul 31
VA	<input type="checkbox"/> Sep 16 - Nov 15	<input type="checkbox"/> Nov 16 - Apr 14	<input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 15	<input type="checkbox"/> Jun 1 - Jul 31
AL	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Mar 15	<input type="checkbox"/> Mar 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
NC	<input type="checkbox"/> Oct 15 - Nov 14	<input type="checkbox"/> Nov 15 - Apr 15	<input type="checkbox"/> Apr 16 - May 31, Aug 1 - Oct 14	<input type="checkbox"/> Jun 1 - Jul 31
MS	<input type="checkbox"/> Oct 1 - Nov 14	<input type="checkbox"/> Nov 15 - Apr 14	<input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 30	<input type="checkbox"/> Jun 1 - Jul 31

- If warranted, does project have flexibility for bat surveys (May 15-Aug 15): **MAYBE** **YES** **NO**

*** For **PROJECT LEADS** whose projects will be reviewed by a Heritage Reviewer (Natural Resources Organization only), **STOP HERE**. Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information. Otherwise continue to Step 5. ***

SECTION 2: REVIEW OF BAT RECORDS (applies to projects with activities from Table 3 ONLY)

STEP 5) Review of bat/cave records conducted by Heritage/OSAR reviewer?

- YES** **NO** (Go to Step 13)

Info below completed by: **Heritage Reviewer** (name) Date

OSAR Reviewer (name) Date

Terrestrial Zoologist (name) Megan Wallrichs Date Apr 20, 2023

- Gray bat records: None Within 3 miles* Within a cave* Within the County
- Indiana bat records: None Within 10 miles* Within a cave* Capture/roost tree* Within the County
- Northern long-eared bat records: None Within 5 miles* Within a cave* Capture/roost tree* Within the County
- Virginia big-eared bat records: None Within 6 miles* Within the County
- Caves: None within 3 mi Within 3 miles but > 0.5 mi Within 0.5 mi but > 0.25 mi* Within 0.25 mi but > 200 feet* Within 200 feet*

- Bat Habitat Inspection Sheet completed?** **NO** **YES**

- Amount of SUITABLE habitat to be removed/burned (may differ from STEP 4e):** (**ac** **trees**)* **N/A**

STEP 6) Provide any additional notes resulting from Heritage Reviewer records review in Notes box below then
 **Go to Step 13**

Notes from Bat Records Review (e.g., historic record; bats not on landscape during action; DOT bridge survey with negative results):

6 suitable bat trees identified within the Project Area during field survey in February 2023; these trees will be avoided per conversations with J. Brellethin

STEPS 7-12 To be Completed by Terrestrial Zoologist (if warranted):

STEP 7) Project will involve:

- Removal of suitable trees within 0.5 mile of P1-P2 Indiana bat hibernacula or 0.25 mile of P3-P4 Indiana bat hibernacula or any NLEB hibernacula.
- Removal of suitable trees within 10 miles of documented Indiana bat (or within 5 miles of NLEB) hibernacula.
- Removal of suitable trees > 10 miles from documented Indiana bat (> 5 miles from NLEB) hibernacula.
- Removal of trees within 150 feet of a documented Indiana bat or northern long-eared bat maternity roost tree.
- Removal of suitable trees within 2.5 miles of Indiana bat roost trees or within 5 miles of Indiana bat capture sites.
- Removal of suitable trees > 2.5 miles from Indiana bat roost trees or > 5 miles from Indiana bat capture sites.
- Removal of documented Indiana bat or NLEB roost tree, if still suitable.
- N/A

STEP 8) Presence/absence surveys were/will be conducted: YES NO TBD

STEP 9) Presence/absence survey results, on NEGATIVE POSITIVE N/A

STEP 10) Project WILL WILL NOT require use of Incidental Take in the amount of acres or trees proposed to be used during the WINTER VOLANT SEASON NON-VOLANT SEASON N/A

STEP 11) Available Incidental Take (prior to accounting for this project) as of

TVA Action	Total 20-year	Winter	Volant Season	Non-Volant Season
5 Operate, Maintain, Retire, Expand, Construct Power Plants				

STEP 12) Amount contributed to TVA's Bat Conservation Fund upon activity completion: \$ OR N/A

TERRESTRIAL ZOOLOGISTS, after completing SECTION 2, review Table 4, modify as needed, and then complete section for Terrestrial Zoologists at end of form.

SECTION 3: REQUIRED CONSERVATION MEASURES

STEP 13) Review Conservation Measures in Table 4 and ensure those selected are relevant to the project. If not, manually override and uncheck irrelevant measures, and explain why in ADDITIONAL NOTES below Table 4.

Did review of Table 4 result in ANY remaining Conservation Measures in **RED**?

- NO** (Go to Step 14)
- YES** (STOP HERE; Submit for Terrestrial Zoology Review. Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date", and submit with project information).

Table 4. TVA's ESA Section 7 Programmatic Bat Consultation Required Conservation Measures

The Conservation Measures in Table 4 are automatically selected based on your choices in Tables 2 and 3 but can be manually overridden, if necessary. To Manually override, press the button and enter your name.

Manual Override

Name: Megan Wallrichs

Check if Applies to Project	Activities Subject To Conservation Measure	Conservation Measure Description
		<p>NV1 - Noise will be short-term, transient, and not significantly different from urban interface or natural events (i.e., thunderstorms) that bats are frequently exposed to when present on the landscape.</p> <p>SSPC2 - Operations involving chemical/fuel storage or resupply and vehicle servicing will be handled outside of riparian zones (streamside management zones) in a manner to prevent these items from reaching a watercourse. Earthen berms or other effective means are installed to protect stream channel from direct surface runoff. Servicing will be done with care to avoid leakage, spillage, and subsequent stream, wetland, or ground water contamination. Oil waste, filters, other litter will be collected and disposed of properly. Equipment servicing and chemical/fuel storage will be limited to locations greater than 300-ft from sinkholes, fissures, or areas draining into known sinkholes, fissures, or other karst features.</p> <p>L2 - Evaluate the use of outdoor lighting during the active season and seek to minimize light pollution when installing new or replacing existing permanent lights by angling lights downward or via other light minimization measures (e.g., dimming, directed lighting, motion-sensitive lighting).</p>

¹Bats addressed in consultation (02/2018), which includes gray bat (listed in 1976), Indiana bat (listed in 1967), northern long-eared bat (listed in 2015), and Virginia big-eared bat (listed in 1979).

Hide All Unchecked Conservation Measures

- HIDE
- UNHIDE

Hide Table 4 Columns 1 and 2 to Facilitate Clean Copy and Paste

- HIDE
- UNHIDE

NOTES (additional info from field review, explanation of no impact or removal of conservation measures).

No known roosts/caves near Project Area; suitable roost trees will be avoided; bridge surveyed for bat use in February 2023 but bridge construction does not support roosting (no crevices or cracks for bats to utilize).

STEP 14) Save completed form (Click File/Save As, name form as "ProjectLead_BatForm_CEC-or-ProjectIDNo_Date") in project environmental documentation (e.g. CEC, Appendix to EA) AND send a copy of form to batstrategy@tva.gov
Submission of this form indicates that Project Lead/Applicant:

Josh Harper

(name) is (or will be made) aware of the requirements below.

- Implementation of conservation measures identified in Table 4 is required to comply with TVA's Endangered Species Act programmatic bat consultation.
- TVA may conduct post-project monitoring to determine if conservation measures were effective in minimizing or avoiding impacts to federally listed bats.

For Use by Terrestrial Zoologist Only

Terrestrial Zoologist acknowledges that Project Lead/Contact (name) has been informed of any relevant conservation measures and/or provided a copy of this form.

For projects that require use of Take and/or contribution to TVA's Bat Conservation Fund, Terrestrial Zoologist acknowledges that Project Lead/Contact has been informed that project will result in use of Incidental Take ac trees and that use of Take will require \$ contribution to TVA's Conservation Fund upon completion of activity (amount entered should be \$0 if cleared in winter).

For Terrestrial Zoology Use Only. Finalize and Print to Noneditable PDF.

Appendix D – Hydrologic Determinations



Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: Unnamed tributary to Wilbur Reservoir		Date/Time: 01/17/2022
Assessors/Affiliation: Cory Chapman, TVA		Project ID : 41973
Site Name/Description: S001 (ASC001)		
Site Location: Wilbur Reservoir Bridge		
HUC (12 digit): Gap Creek-Watauga River(060101030505)	Latitude: 36.33715849	
Previous Rainfall (7-days) : 2.23in	Longitude: -82.11784113	
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :		
Watershed Size :	County: Carter	
Soil Type(s) / Geology :	Source:	
Surrounding Land Use : Forested		
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Slight		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	<input type="checkbox"/>	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	<input type="checkbox"/>	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	<input type="checkbox"/>	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	<input type="checkbox"/>	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	<input checked="" type="checkbox"/>	Stream
6. Presence of fish (except <i>Gambusia</i>)	<input type="checkbox"/>	Stream
7. Presence of naturally occurring ground water table connection	<input type="checkbox"/>	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	<input type="checkbox"/>	Stream
9. Evidence watercourse has been used as a supply of drinking water	<input type="checkbox"/>	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM
Secondary Indicator Score (if applicable) = 0.00

Justification / Notes :

10x3. Multiple tricoptera taxa present. Culverted under road.



Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: Unnamed tributary to Wilbur Reservoir		Date/Time: 01/17/2022
Assessors/Affiliation: Cory Chapman, TVA		Project ID : 41973
Site Name/Description: S001 (ASC001)		
Site Location: Wilbur Reservoir Bridge		
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Previous Rainfall (7-days) : 2.23in	Longitude: -82.11784113	
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :		
Watershed Size :	County: Carter	
Soil Type(s) / Geology :	Source:	
Surrounding Land Use : Forested		
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Slight		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	<input type="checkbox"/>	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	<input type="checkbox"/>	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	<input type="checkbox"/>	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	<input type="checkbox"/>	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	<input checked="" type="checkbox"/>	Stream
6. Presence of fish (except <i>Gambusia</i>)	<input type="checkbox"/>	Stream
7. Presence of naturally occurring ground water table connection	<input type="checkbox"/>	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	<input type="checkbox"/>	Stream
9. Evidence watercourse has been used as a supply of drinking water	<input type="checkbox"/>	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM
Secondary Indicator Score (if applicable) = 0.00

Justification / Notes :

10x3. Multiple tricoptera taxa present. Culverted under road.

